

**The Effects of the Development of
Private Finance Initiatives (PFIs) in the
UK and Their Relevance in the
Implementation of Build-Operate-
Transfer (BOT) Projects in Chinese
Road and Water Sectors**

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The Effects of the Development of Private Finance Initiatives (PFIs) in the UK and Their Relevance in the Implementation of Build-Operate-Transfer (BOT) Projects in Chinese Road and Water Sectors

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ABSTRACT

There has been a rapid growth of private participation in infrastructure projects throughout the world in the last three decades. China as the largest developing country in the world has a huge amount of demands for high quality infrastructure projects and public services. The government has actively developed and used the Build-Operation-Transfer (BOT) model to deliver public facilities and services, particularly after 2002. Certain benefits have been brought by the adoption of the BOT model in China's motorway and water sectors. However, issues were also found in the processes behind BOT applications. International organisations as well as scholars suggested that China should learn experiences and lessons from the UK and its PFI scheme. The UK has been the leading country to use private finance in developing public buildings and services. However, very little has been written addressing how lessons from British PFIs can be learnt by China to improve its BOT practice.

This study is an attempt to address this vacuum in the existed literature. It was designed to explore the current problems of using BOTs in Chinese motorway and water sectors and looks at what needs to be improved, based upon the PFI lessons in the UK.

A mixture of qualitative and quantitative methods has been employed and various methods of data collection used in this study. These included: 21 interviews, 2 observations and one focus group and the analysis on 14 government reports about BOT's in China. The governments' decision-makers, directors, project managers and contractors were involved in the research to explore the results and emerging issues involving the implementation of BOT models in 87 Chinese motorway and water projects in 10 cities covering six provinces. As a result of its findings, the research is able to discuss and identify the relevant experiences and lessons from PFIs in the UK to improve further application of China's BOTs.

This study fills the gap in knowledge regarding comparisons between PFIs and BOTs. It also gives recommendations for good practice in relation to Chinese BOT policy decision making, development and evaluation. Finally, the study hopes to give recommendations that enable the implementation of BOT model in Chinese motorway and water sectors to be more successful in the future.

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Part One

Introduction

Chapter 1 Introduction

1.1 Background to study

Prior to the 1980s, the principal providers of infrastructure and public services in most countries were the government or state-owned enterprises, with the exception of the United States (Parker and Saal, 2003, Worthington and Britton, 2005, Hillman, 2009). Governments in both the developed and the developing world had built and operated a large number of public sector organisations to provide the necessary ‘public infrastructure, goods, and services’ (Savas, 2000). In those days, the UK possessed one of the largest public sectors in Europe (Savas, 2000; Bishop and Kay, 1989), which existed not only within the public service and social infrastructure, but also in ‘strategic’ economic sectors such as communications, steel, automotive, shipbuilding and aerospace industries. These nationalized industries’ share of the UK’s Gross Domestic Product (GDP) was ‘about 10 percent in 1979, one seventh of the total investment and about one-tenth of the Retail Prices Index’ (OECD, 1998:3). However, from 1980 the government’s position of control in state economies began to change. Governments in Europe and elsewhere embarked on a process of privatization and embraced market-oriented strategies, and applied these to social infrastructure and public service. A large number of government-owned businesses and assets were privatized, resulting in the selling of public-owned assets to the private sector completely or partially (Parker and Saal, 2003). In its broadest sense, ‘privatisation’ involves a massive scale of transfer of assets, employees or different forms of ‘economic activity’ from the public to the private sector. In countries such as the UK, this has taken a number of forms including (Worthington and Britton, 2005):

- *the sale of nationalized industries or industries in which the government had a substantial shareholding;*
- *the sale of state-owned assets and facilities;*
- *the contracting-out of services normally provided by the public sector (e.g. hospital cleaning and catering);*
- *the deregulation of activities over which the state had previously placed some*

restriction (e.g. postal services);

- *the introduction of private capital into areas traditionally financed by the public sector (e.g. PFI in the road system);*
- *the sale of local-authority-owned property to private citizens or organisations (e.g. council houses);*
- *and, the privatization of government agencies.*

These initiatives have taken many forms, but the strategy underpinning them was aimed to restructure whole services as markets with a diversity of providers. Governments have actively introduced market mechanisms and the greater involvement of profit-driven companies into the public service and social infrastructure sectors since the 1980s. Parker and Saal (2003) and Private Participation in Infrastructure department of the World Bank (PPI, 2010) have investigated that, over the last decade such privatization and marketisation strategies have been adopted in over 100 countries, although specific backgrounds and contexts have differed.

In the case of the UK, public corporations were privatised from the 1980s, to reform and re-construct the public sector. The wave of privatizations from 1980 also drove the government to continuously seek to increase the involvement of the private sector in the delivery of public goods and services, areas that had traditionally been deemed as the 'state's responsibilities' (Savas, 2000). New approaches to developing infrastructure and providing public services were attempted first in the UK. Notably through the Private Finance Initiative (PFI) that was introduced by the Conservative government in 1992, and confirmed by the Labour government after 1997. PFI is a form of Public-Private-Partnership (PPP), which refers to the collaborations between the government and the private sector to provide public services and social infrastructure. The PFI in the UK is a programme encompassing arrangements whereby private sector partners come together to form a consortium to provide an asset-based public service under contract to a public body (Grimsey and Lewis, 2004). The Treasury (2003a:3) explained, 'the PFI and other arrangements where the public sector contracts to purchase quality services on a long-term basis so as to take advantage of private sector management skills incentivised by having private finance at risk. This includes concessions and franchises, where a private sector partner takes on the responsibility for providing a public service, including maintaining, enhancing or constructing the necessary infrastructure'.

Arguably, the PFI has introduced and mobilised a considerable amount of private sector investment into many fields of public infrastructures with a more extensive role in the UK, such as transport, defence, health, education and prisons (Whitfield, 2007). Instead of the traditional public-funded projects that involve the private sector in short-term relationships with public agents, the PFI is a long-term contract-based arrangement with the private sector for delivering public services over in a period of twenty or thirty years. Under the PFI arrangement, the different functions of design, build, finance, operation and maintenance are integrated together (called the DBFO model). The private sector normally has several companies organised into a consortium, which can take comprehensive roles in managing public projects, e.g. the main contractor, hard facility management contractor, soft facility management contractor, and financier. As returns within the PFI contract, private contractors receive service charges for the associated services from the public bodies annually until the contract finishes. However, due to the payment mechanism of the British PFIs, the public bodies normally make payments to the contractors through budget revenues.

1.1.1 British PFI as an expanding and global policy

PFI is aimed at providing an alternative means for funding public sector services and infrastructure without increasing public borrowings or raising taxes (Kerr, 1998, Ruane, 2000). Particularly after 1997, when the Labour Party won the general election, the PFI has been an important part of the UK government's infrastructure investment programme, and covering all major areas of public infrastructure and service. By 2010, according to the Partnerships UK (2010) database, there had been almost 920 PPP (777 PFI) project contracts signed, and 702 of these had been put into operation, with an estimated value of almost £72 bn, 36.7% (£26.45 bn) of which had been accounted for by the transport industry. Out of all of the departments, the Department of Health has signed the largest number of PFI contracts, with 279 with a total value of just under £13.6 bn. There have also been 42 projects in the water and waste sectors, with a value of £3.5 bn.

Use of the PFI model is not restricted to the UK. The British PFI model has strongly influenced other countries, both the industrialized and the developing (Treasury, 2000, Holden, 2009, Pavoni, et. al, 2007). Despite the debates and problems that have arisen around the uses of PFIs in the UK, this approach is being increasingly utilized and

studied across the world in countries such as Spain, the Netherlands, Germany, Ireland, Australia, Canada, South Africa, Japan, Malaysia, Hong Kong Special Administrative Region, and China (CBI, 2007, Pavoni, et. al, 2007). Furthermore, the use of British PFIs has been highly advocated by a number of international bodies, including the IMF (2007), the World Bank (PPI, 2010), the European Committee (2005), the Asian Development Bank (2000) , and European Investment Bank (Barrett, 2007). A large number of developing countries in Asia, Africa, Latin America and Central Europe are either already implementing the PFI, or are considering the feasibility of doing so. In addition, there is clear evidence that the governments in the UK (Department of Health, The Treasury and Department of Trade and Industry), the major British PFI contractors, financiers and consulting firms actively ‘exported’ the PFI model and its related services to other developed and developing countries, particularly for China, the largest developing country in the world, with huge demands for bigger and better infrastructure and public services (Holden, 2009, Pavoni, et. al, 2007) .

1.1.2 Chinese Build-Operation-Transfer (BOT) as a growing and infantile scheme

Although China has a long history of using private finance to fund public services and infrastructure, maintaining public facilities, the recent implementation of Build-Operation-Transfer (BOT) started in 1986. Both central and local governments in China, which have a very large public sector, have experimentally applied private finance into developing public infrastructure projects over the last three decades. The programme China adopted is known as the ‘Build-Operate-Transfer’ model (BOT) which was not initially introduced by the government of China, but by private companies from Hong Kong in the 1980s (see chapter 2, pages 33-34). BOT is the most popular model of private participation in Chinese public infrastructure. It was defined by the Ministry of Construction (2004) as a concession contract between the government and private contractors which allows for private investor financing, operation and delivery of public facilities and services within a certain period. The idea behind BOT can be seen as a variant of the PFI (DBFO), which states that in a contracted period of time (normally in 25 or 30 years), the private sector contractor will finance, build, operate and maintain an asset or a facility, collecting payment from the usage charges until the contract has matured. The users of BOT can be the government in China and its departments, or the

end-users of the BOT's service or facilities (for instance, the BOT toll roads in China). When the BOT contract finishes, the private sector will transfer the project or the facilities to the public sector.

Via an initial comparison, common features can be found in the definitions of British PFI and the Chinese BOT model (in theory). First, the initial objective or claim of BOT and PFI is to attract private finance into the public sector, plugging an infrastructure gap or deficit. The impact of BOT and a PFI in the short-term is that governments can mobilise large amounts of financing on urgently needed public infrastructure projects without increasing public spending and debts (in the UK, this was known as the Off-Balance Sheet Financing). Second, the government as the client of PFI or BOT project defines the quality and quantity of services and facilities, and the timeframe within which they are to be delivered in the contract. Third, the private sector, as contractor of the project, is responsible for delivering the defined service, while the government should be involved in regulation and procurement (State Planning Commission, 1996, China BOT circular, article 22). Fourth, the duration of the PFI and the BOT agreement between the public and private sector will be long-term, typically between 25 and 30 years, depending on the nature of the projects or services. Fifth, responsibilities and risks are allocated to the party best able to manage them, but both the BOT and the PFI involve the substantial transfer of risk to private partners. Risks transfer and allocation in BOTs and PFIs also have to be evaluated in the projects' tendering and bidding phases as part, and written into the contract. Sixth, the private sector finances the project (wholly or in part) and recoups its investment from charges or payments made during the life of the contract (SPC, 1996, Chapter III). Seventh, the private sector must deliver good quality, cost-effective services throughout the project lifecycle, based upon the specific standards or requirements on outputs. And finally, the different functions of (design,) construction, operation and maintenance are integrated.

At the same time, some minor and implicit differences between the BOT and the PFI were also observed. First of all, under the Chinese BOT scheme, the government is normally required to provide the design proposals and planning appraisals for the projects, but this is not compulsory. In some BOT cases, private contractors could make changes on the project's design or provide their own design (e.g. Chengdu City No. 6 water Factory BOT was designed by the BOT contractor— Veolia, a French water

multinational) . While in the majority of the PFI cases in the UK, the design of the PFI is provided by the private contractors, except in a few of cases, such as the Berlin Embassy PFI project. Some scholars (for instance, Laughlin and Broadbent, 2005) believed that PFI (DBFO) model is a more advanced and complicated model than BOT, because the government needs to write an ‘output specification’ on the facilities or the services required, and private contractor is responsible for ‘design’ under the PFI (DBFO) model. However, Laughlin and Broadbent (2005) also pointed out, in the BOT model there is an ‘implicit expectation’ that the private sector partner will have control over design, working from an output and outcome specification supplied by the public sector. Secondly, a difference existed between the objectives of the BOT and the PFI. For instance, the British government claimed that it would not consider using PFIs unless they could show the potential to obtain better ‘value for money’ than traditional public procurement options (Treasury, 2006). In contrast, Chinese BOT does not compulsorily require BOT projects to represent ‘value for money’. As a developing country, the government in China may focus on attracting private investment rather than on value for money (National Development and Reform Committee, the NDRC, China, 2004). But it now seems the Chinese central government (Ministry of Construction, MOC, 2005 and the NDRC, 2010) has started to address ‘value-for-money’ matters when evaluating performance and efficiency of BOT contracts in the recent six years, since more and more projects have been put into operations since 2002.

In addition, the payment mechanisms of the British PFI and Chinese BOT differed. Most of the Chinese motorway and a large number of water BOTs directly charge the users of the services (pay as you go model). While in the UK, the governments usually ‘purchased’ the services from the contractors, except for several road and transport PFI cases, e.g. M6 DBFO project, Dartford River Crossing PFI, Sky Bridge PFI etc (Shaoul, 2008). But, in practice, this difference between the BOT and the PFI was not explicit, due to more and more local governments in China making payments to BOT contractors through the budgets in recently developed projects. For instance, Wuhan City in China started to use a ‘Shadow Toll’ system into all urban BOT bridges and tunnels, with a large portion of payments to the BOT contractors were from the government budgets. These payment arrangements are similar to the British PFI. The initial comparison between the BOT and the PFI indicates that the fundamental elements of the two

programmes are the same, although some implicit differences were found. Therefore, some researchers, such as Grimsey and Lewis (2004), Qin and Yu (2005), Wang (2009) believe that the BOT model and the PFI are fairly similar and comparable, due to the fundamentals and the ideas underpinning them.

The Chinese BOT policy was developed and flourished within the context of China's market-oriented reforms and privatisations after 1979. This followed the Chinese 'agricultural privatisation' in 1979 and the 'Open-door' policy that was adopted in 1980. In 1992, China declared that its objective was to achieve 'a socialist market economy'. The first step in building this market economy was privatisation and restructure of State-owned Enterprises (SOEs) on a massive scale from 1986, which led in some cases to bankruptcies in the late 1990s. In 2004, the remaining SOEs, including energy, telecoms, airlines, railways, steel, banking, public utilities and social infrastructure, represented only 30% of GDP, a reduction from the 78.8% it had accounted for in 1978 (OECD, 2009: 4).

Since 2002, there have been new trends and strategies used for the marketisation of state-owned assets. The pressures of fiscal shortfall, rapid economic development and abnormal urbanisations in China led the government to make more aggressive use of the private sector by using various forms of the BOT to deliver social infrastructure and public services. Several Circulars were published by the government in 2002, 2004, 2005 and 2010, in order to encourage marketisation in public utilities, transportation, energy as well as telecom. By the end of 2009, 884 BOT contracts had been signed in China, with a value of \$107bn (£ 70bn). Most recently, the central government also declared that the strict regulations and market entry limitations on China's healthcare, education, telecom, civil aviation, railway and defence sectors would be removed for Chinese domestic investors, and partly removed for international investors from 2010. The National State Council acknowledged these newly opened sectors to Chinese and international investors and it is expected that new Chinese BOTs will be implemented in these areas over the next five years.

However, number of problems have been emerged in China's implementation of BOT. China has a limited history and experience of applying BOTs and operating a market economy in the last 30 years. Although a huge number of BOTs have been implemented in China's social infrastructure and public services, the practice of Chinese BOTs is still

underdeveloped. Both the government and private sector have still not learnt how to properly use BOTs. To date, the result of using BOTs in China remains unclear since few studies have been conducted, and a limited amount of data has been released by the government. Government, policy makers and practitioners have not yet conducted a full investigation into either of the BOT related theories or of the lessons learned from other countries. In fact, it can be argued that the Chinese government has rushed and been arbitrary to open so many public service sectors and infrastructure to private investors in 2010. As prior research (Adams, *et. al*, 2003, Qin and Yu, 2005, the World Bank, 2003, Handley-Schachler and Gao, 2003) suggests, in order to make the best use of BOTs in China, the authorities could benefit from carefully studying the lessons and experiences from other countries, particularly the UK. The UK has the largest number of PFI contracts in Europe, and given the UK's role in developing PFI to an advanced stage, there could be benefits for China's government to use the UK as an example, to consider what lessons can be learnt for developing China's social infrastructure and public services. This thesis will discuss these issues, drawing on the lessons from a policy (the British PFI) that has been used in one country (the UK), in order to improve a similar policy (the Chinese BOT) in another country (China).

1.2 Theoretical Underpinnings of BOT and PFI: New Public Management and New Institutional Economics

Although these topics are discussed in later chapters in the detailed cases of the UK and China, in order to gain a broader understanding of the issues around BOTs and PFIs, it is necessary to explore and clarify the key ideas and theories that underpin them. Much of the previous literature has examined BOTs and PFIs as part of the New Public Management (NPM) reforms (Qin and Yu, 2005, Mayston, 1999, Broadbent and Laughlin, 2004, Dunleavy, *et. al.*, 2005, Ruane, 2004), underpinned by the ideas of Public Choice Theory (Niskanen, 2004), Principal-Agent Theory (Lane, 2005) and the Transaction Costs Economics (Williamson, 1975, 1985, 1996). Broadbent and Laughlin (2004) commented that the PFI is a recent extension of what has now become well known as the 'New Public Management' (NPM) agenda for changes in the way public services are provided. The NPM normally refers to the wave of public sector reforms throughout the world since the 1980s. The term NPM is often used in discussing the issues about 'reinventing government' (Osborne and Gaebler, 1992). This involves

examples such as, how governments organise the public sector and services, in what structure and by what means, to solve problems in their countries (and within what contexts). It is difficult to define the term of NPM, since there are still a number of debates on it (Osborne and McLaughlin, 2002, Barzelay, 2002 and Flynn, 2002). Some scholars, such as Boston (1991) believed that NPM is the practical application of the New Institutional Economics (NIEs). NPM is a series of public sector reforms in western countries, which are driven by the associated theories (Boston, *et. al.*, 1991). However, some scholars believed that the NPM is just a practical pattern of policy choice in different countries and within different contexts (Barzely, 2002). Therefore, it is not possible to offer a unified definition or a model without considering the detailed contexts. But, by reviewing the previous studies, key features of NPM can be summarised here, as Hood (1995), and Osborne and McLaughlin (2002) discussed: the new public management reforms normally

- focus on *hands-on* and *entrepreneurial management*,
- uses explicit *standards* and *measures of performance*,
- emphasis on *out-put control* rather than *input*,
- adopt *decentralisation* of public services and management,
- promote *competition* in the provision of public services,
- stress on *private sector styles of management* and *superiority*,
- promote *discipline* and *cost saving* in resource allocation,
- and finally, *separate* political decision-making from the direct management of public services.

The major reasons, drivers and paths of implementation of NPM differed from country to country. But in the case of the UK, the NPM was adopted and driven by a articulated number of dissatisfactions and critiques on traditional public administration and the welfare state system, e.g. dissatisfaction with poor public services, and inefficient and ineffective management in the public sector (Osbone and McLaughlin, 2002). Meanwhile, NPM also appears to be heavily dependent on some theoretical schools developed in the western countries, which was known as the New Institutional Economics, including public choice theory, principal agent theory and transaction cost economics (Hood, 1995, Boston, *et. al.*, 1991, Greve and Jerspersen, 1999, Lane, 2002, Barzelay, 2002, Broadbent and Laughlin, 2004).

1.2.1 Public Choice Theory

The first theory highly relevant to the NPM is the public choice theory. The heart of the public choice theory is the behaviours and incentives of politicians and bureaucrats. The theory is often discussed when a political decision contradicts the public interests. The public choice theory primarily assumed that politicians and bureaucrats are motivated by self-interest (as an 'economic man') rather than by public interests. For example factors such as salary, good working conditions, public reputation, power and the ease of managing the bureau' (Niksanen, 1971). With this assumption, the public choice theorists argued that 'politicians' in a *liberal democratic state* often made a policy or a decision under pressures from 'interests groups' or 'lobbying organisations', which could help them to win their next election (the biggest 'interest' for them) (Buchanan and Tullock, 1962, Downs, 1967). Therefore, the policies and decisions made by self-interested politicians often are short-term oriented, and only reflect a small number of viewpoints rather than the whole of public and social welfares in long-term. The negative effects of behaviours of self-interested politicians often led to a number of issues with public sector management, e.g. waste of public resource allocation and a large amount of government deficit.

At the same time, the public choice theorists (Niksanen, 2004) believed that the 'bureaucrats' also are self-interested. The officials and managers in the government, public agencies and public-owned enterprises would only promote their own interests, such as rising their own wages, benefits and achieve bigger budgets. The bureaucrats always maximise their biggest possible benefits and at the least costs. These decisions often lead to inefficiency and ineffectiveness in the public sector management, e.g. a growing of department budgets, large public sectors, but the poor public services.

The problems that the public choice theory discussed appears to be especially valid in the case of public utilities, social services and the state-owned enterprises. Boyne et. al. (2003) discussed, that public organisations have been unduly protected from the pressures of competition, because these organisations had a large share of the market in public services and infrastructure, e.g. health, education, housing, water, gas and public transportation. Due to the public agencies monopolising these public services and social infrastructure, the public had little option to choose the services they used. That

suggests that even the public are not satisfied with the services provided by the public agencies or enterprises. However they had no choice, but to use the products provided by the bureaucracy. Meanwhile, the bureaucrats have not incentives to improve their products and services or cutting costs, since there are few pressures from competition in the market. In addition, due to imperfect information and a poor performance evaluating system in the public sector, it is difficult to know 'real' costs, or the performance and productions of bureaucrats. Under this situation, it is easy for officials to persuade politicians to allocate more budgetary financing than is really needed for service provision. As Niskanen (2004) argues that although big bureaucracies are especially able to extract revenue from their political sponsors, they provide low-quality services at high cost, and evade attempts to monitor their performance. Taken these arguments together, the selfishness and monopoly power of public officials lead to a number of negative effects on the production of public utilities and social services: such as oversupply, poor efficiency, quality, effectiveness and responsiveness of public services, and continuing expansion of the public organisations(Boyne *et.al.*, 2003).

By criticising politicians and bureaucracy, in order to improve the efficiency and effectiveness of the public sector, the public choice theorists recommend that a dramatic reform in the public sector is needed. These reforms may include establishing a competitive structure (market) in the public sector, creating the competition between public and private organisations. Also, the performance information of public agencies and enterprises should be more transparent to the public. Furthermore, it is best to minimise the role of the state and reduce the size of the public sector. The, private sector should be allowed to participate in the public service (Niskanen, 2004).

1.2.2 Principal –Agent Theory

The second theory to have an effect on public sector reforms is the principal-agent theory. This theory assumes that the agent (managers) and the principal (shareholders) have different interests and are both attempting to maximize their interests: in the private sector, shareholders maximize profits; managers maximize salaries and other non-financial benefits. The principal wants to induce the agent to act in the principal's interests, but the principal's control over the agent is always somewhat imperfect due to

the lack of full information about the circumstances and behaviour of the agent. Therefore, the principal faces monitoring problems and associated costs (Alchian and Demsetz 1972; Vickers and Yarrow 1988).

According to this theory, the central issue for the principal is to strengthen monitoring the performance of the agent and create the optimal incentive scheme for the agent in order to solve the principal-agent dilemma and thus ensure the efficient operation of the firm. The solutions for the principal-agent issues is that the activities of agents should be closely monitored by principals. Secondly, a compensation contract or agreement should be made between principal and agent, to build an incentive for agents, and to specify and clarify their obligations and rights.

The agency problem existed not only in the private sector, but also in the public sector. However, as the principal-agent theory discussed, the problem seems to be more complex in the public sector, for some reasons (Boyne et. al., 2003). Firstly, it is really difficult to find out who the principals are and what they want in the cases of public sector management. In theory, the public as a whole is the owners of the public sector, and with a variety of agents acting on its behalf, e.g. government officials, members of parliament, managers of public agencies and state-owned enterprises. A variety of agents in the public sector also do not know who their 'principal' is and what the public 'interests' are in many cases. Secondly, the principal-agent theorists argued (Alchian and Demsetz, 1972, Boyne et. al., 2003 and Hassard et al. 2007) that it is difficult to identify and evaluate the 'performance' of the agents (e.g. education and healthcare), due to the characteristics of public sector. The public and taxpayers do not have the effective means and information to evaluate and monitor the work of these agents in public agencies and organisations. Thirdly, unlike private firms, the agents (e.g. officials, managers and MPs) in the public sector are not profit-driven and there is no pressure to gain greater 'market shares'. Moreover, the bankruptcy threat does not exist in the public agencies and the state-owned enterprises. Therefore, the agents (officials and managers in the public sector) do not necessarily perform as the principal (the public) wished, or they have few incentives to do so. As a result, the principal-agent problem is likely to be worse in the public sector. The principal-agent and the 'property-right' theorists (e.g. Alchian and Demsetz, 1972, Lane, 2002) suggest, that production in the private sector has more efficient and economic than the production under the public

ownership, due to the agency problem in the private sector is not serious as the public sector experienced.

To deal with the problems of principal-agent in the public sector, particularly in the public service and infrastructure sectors, the principal-agent theorists (Alchian and Demsetz, 1972, Lane, 2002, Boyne et. al., 2003) suggest that monitoring the agents' performance should be enhanced, more information should be disclosed by the bureaucrats (agent), and an optimal incentive scheme for the agent should be established, e.g. the uses of different forms of 'contract'. Also, the ownership-solution literature (Alchian and Demsetz, 1972) claimed privatizing or contracting out the public services and works to private contractors should be promoted as much as possible. It may reduce the agent problem in the public sector, since private enterprise was assumed to have fewer agency problems than public sector and, it is less costly to monitor agents in private than the public enterprises (Hassard et. al., 2007).

1.2.3 Transaction Cost Economics

The third theory which has profound influences on the new public management practice is the Transaction Costs Economics (TCEs). Transaction cost economics is an approach to analysing how a firm or an organisation (in private and public sector) organise their production and under 'what' kind of governance structure and by what instruments. The heart of the transaction cost economics is, as its name presents, 'the costs' (or 'fees') associated with a trade. An important point of the transaction cost economics is: in the 'real world', that the exchange of goods and services are neither easy nor expense-free. To achieve an agreement between a good or a service's producer and purchaser, there are costs incurred in this process. Costs are associated with the searching for potential trade partners and informing them of the opportunity to trade, negotiating the terms of the exchange and write an agreement, and the costs involved in monitoring and enforcing contracts on the other party, regarding the terms of the agreement.

The concept of the 'transaction cost' was discussed by Coase (1937) in his work, *the nature of firm*. Two questions were raised by Coase firstly: 'why do firms sometimes choose to buy their inputs in the market place, and at other times, decide to make input themselves? Secondly, when is it best to organize production through the market and when is it best to organize it through a hierarchy of employees?' (Flynn, 2007: 228). These questions were so-called as: the choice between 'buy or make'. As TCE

(Williamson, 1999) indicates that some transactions are better using market-arrangements when the transaction costs of making a contract are low, but others may be suited to hierarchical or rule-driven organization (in-house provision). The key point of the answers for these questions is the 'transaction cost'. From this view of point, the transaction cost economics is studying a firm or an organization how to organize, produce and distribute a particular good or service with what kind of institutions, e.g. hierarchy structure, market mechanism, or a mix of them. In other words, the TCEs discussed the 'efficiency matters' from the perspectives of institutional governance structure.

Williamson is another main contributor for the development of the transaction cost economics. As Williamson (1967, 1985) pointed out, the existence of transaction costs depended on various factors (e.g. human factors and environmental factors), named as 'bounded rationality', 'opportunistic behaviours', 'uncertainty', and the nature of the transaction. Unlike neoclassical economics, the basic assumption of the transaction cost economics assumes that all individuals do not know the true model of the world and calculate their optimal actions with fewer costs. In other words, all individuals may calculate their actions according to their own situations and abilities (rationality), but this calculation is not 'perfect' in the 'real world' (Simon, 1982). This is called '*bounded rationality*' which is contradictory to the 'economic man' and 'rationality' assumption in neoclassical economics. Another human factor is called *opportunistic behaviours*, which refers to the behavioural aspect that arises under the features of limited and asymmetric information, one party to the transaction attempts to take advantage of the other. This term often includes:

- *Adverse selection*: when one of the parties has a pre-contract informational advantage which leads to signalling and screening costs.
- *Moral Hazard*: in cases where the non-observability of one of the parties' action provokes costs of monitoring or incentive schemes. And *Non-verifiability* of information to outsiders: when it is difficult or expensive to audit a firm.

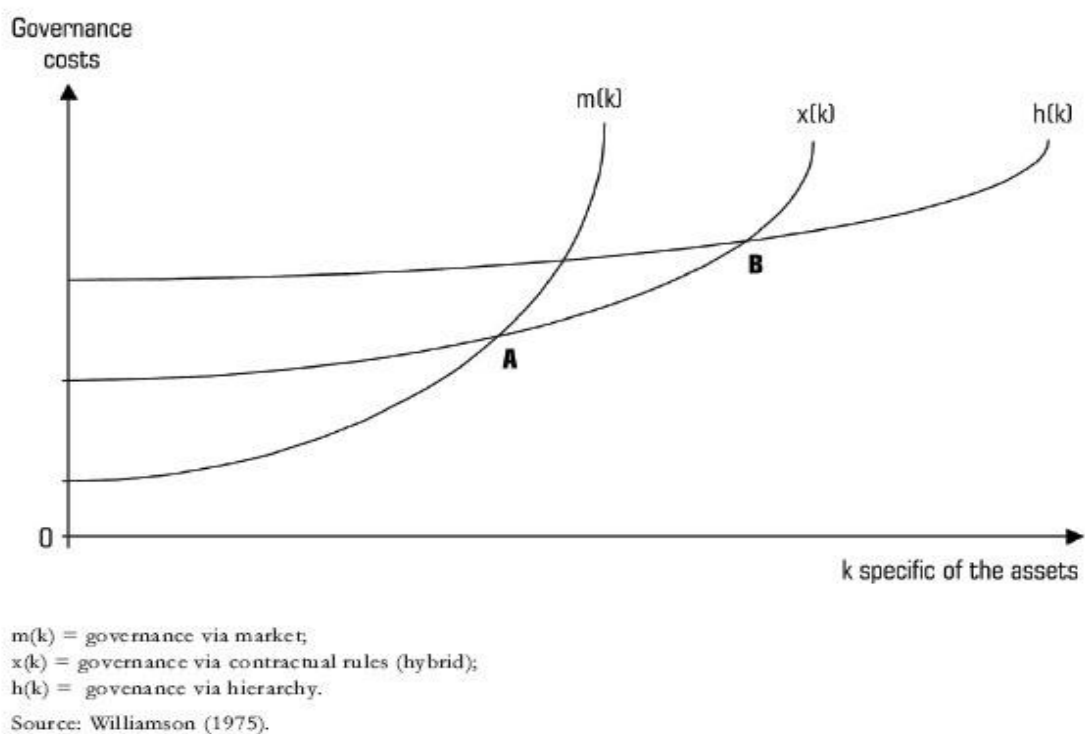
Williamson and other scholars explained that a number of factors may also have an impact on the costs of transactions. But these contributing factors are from the 'environment', the market and the nature of transactions such as Flynn (2007:229) summarized:

- *Uncertainty*: there are too many uncertain events and factors associated with the transaction in the future, therefore, it is impossible to take them all into account in a contract.
- *Complexity*: the transaction is too complex to consider all potential options and choice
- *Language*: the language of contracts may not be specified as both parties agreed on;
- *Small numbers*: few suppliers in the market thereby, probably leading to opportunistic behaviours to the disadvantage of the purchasers;
- *Information ‘impactedness’* (known as information asymmetry): suppliers of a transaction may have more information, than purchasers or other parties
- *Atmosphere*: the parties of transaction may be influenced by other factors, such as, politics, social values, moral values and the norms, not purely ‘self-interests’ seekers.

Bounded rationality, opportunistic behaviours as well as the situation in the market give rise to the possibility that one or other of the parties to a transaction will exploit their information advantage at either the pre-contract or post-contract stages. In the real exchanges in the market, the TCE theorists (Williamson, 1973, Milgrom and Roberts, 1992, Ménard and Shirley, 2005) suggest it is difficult and impossible to write a ‘complete contract’ in practice from ex-ante contract design, or in its interpretation ex-post. Most contracts in practice are incomplete which cover all possible events or contingencies, which would be written in such a way that both parties know exactly what would be the consequences of every possible event, excepted the most simple contracts. Even if writing a ‘complete contract’ were possible, the costs of designing such contract would be extremely high. Contractual incompleteness is another important part of the TCEs. An *incomplete contract* leads to a significant increase in the costs of the transaction through market mechanism, particularly in the ex post contracting stage when a contract has been made and put into enforcement. Both parties of the contract may behave opportunistically when environment changes in the ex post contractual stage. In some cases, the danger of opportunism is increased where there is an ‘*asset specificity*’ matter (Williamson, 1985). This refers to the investments associated with the transaction are specific to the parties involved, and (these specific investments) with a

very low value for other uses. Specific investments for the transaction result in a situation of *bilateral monopoly* where both parties are confined to exchanging with each other (Walsh, 1995). In other words, both parties are 'locked-in' to the exchange by the contract. In this situation, both sides of the transaction are difficult to 'quit', unless high compensation is paid (or one party writes off the specific investments). *Asymmetric lock-in* occurs where one party has made the majority of the specific investments. In the situation of 'lock-in', any changes in the balance of power creates scope for opportunistic behaviour or 'hold-up' whereby one party attempts to exploit the dependency of the other party which has been brought about by the latter's specific investment (Walsh, 1995). The 'hold-up' issue is significant when there are a small number of suppliers in the market.

Figure 1_ Governance mode costs and asset specificity degree



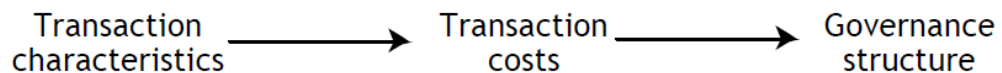
The TCEs analysis shows, for example, if a transaction is highly asset-specified thus transaction cost is high, the firm or the organisation may prefer the hierarchy structure rather than use the market mechanism. However if a transaction is not asset-specific, the firm may preferred the market structure. Furthermore, it is also possible that a firm may choose a governance structure which combined the hierarchy and market instruments (e.g. a hybrid governance structure). This is because the transaction costs of this

governance structure is lower than others, see last page, figure 1.1: the curve A-B.

Secondly, if a transaction has a number of uncertainties with environmental and the human factors (such as, rational boundary, opportunisms, trusts), then costs of the transaction are high (such as the costs of designing, drafting, negotiating and monitoring of a contract). In this case, the firm may organise its production internally, not buying from the market. Thirdly, if frequency of a transaction is high, generally, the firm may tend to internally organise this transaction, in order to reduce the costs of transaction and production. The TCE does not offer a certain solution for any contracting issues, but it provides a framework to analyse the possible governance structure of public service production and delivery, in terms of human factors, environmental conditions (uncertainty) and the nature of the transaction, see diagram 1.2 below.

Diagram 1.2 From the characteristic of transaction to the Governance structure

Transaction Cost Economics Model



Source: adapted from Williamson, 1984

Due to uncertainty and asset specificity, with frequency of transaction, transaction cost analysis suggests a kind of ‘relational contracting’ which is a relationship based upon ‘trust’ between both parties within the contract. In this way, the buyer and supplier of a contract treat the ‘contract’ as an outline or a guide and does not ‘entirely rely on the contract for the supply of a particular good at particular time’ (Flynn, 2007:230). In a relational contract, both parties of the contract establish a long-term relationship and achieve ‘win-win’ results. The relational contract was advocated, this is because it can reduce the opportunistic behaviours in the contracting process, therefore reducing the transaction costs.

The TCE analysis is applied into different areas of the private and public sectors, particularly in contracting matters within the public sector. Notably, the TCEs can be used to explain and analyse that practical issues of contracting out public services and productions by the private sector. There are many practical factors and problems in the design and management of contract, that will impact on the production and provision of public services. The TCE is fairly relevant to this research. Based on the analysis of

TCEs, it can be seen that BOT and PFI contract is not ‘complete contract’, due to the complexity, imperfect information, bounded rationality and the nature of a long-term contract. The problems of ‘boundary rationality’, ‘information asymmetry’, ‘opportunism’ and ‘trust’ between the government and contractors will have influences in the implementation of BOT and PFI contracts in the real world. Whether PFI and BOT were a suitable governance structure to develop social infrastructure and public services, it needs to consider each individual case in terms of ‘costs of transaction’.

1.2.4 Applying New Institution Economics in New Public Management: the relevance to the PFI and the BOT

To sum up, by reviewed these prescriptions of NIEs and practice of NPM, many of them are directly and indirectly relevant to the implementation of PFI and BOT see table 1.3, next page. Therefore, many scholars believed that the PFI and the BOT are the extension of the NPM, and the application of NIE.

From the perspective of public choice theory, PFI and BOT can establish a competitive structure in the public sector, creating the competition between public and private organisations. Also, the uses of PFI and BOT are good approaches to minimise the role of the state and reduce the size of the public sector.

Under the framework of PFI and BOT, in the views of principal-agent theory, the private sector wants to earn a return on its investments and perform though designing, building, financing and operating a project. The public sector wants contracts where incentives exist for the private sector to deliver services on time to specified standards year after year. The public sector shares an identity of interest with private contractors whose return on investment will depend on these services being delivered to high standards.

Table 1.3 The relevance of PFI and BOT to the prescriptions of the NIEs and the

strategies of the NPM

<i>NIE suggestions And NPM Practice</i>	<i>Change incentive and traditional bureaucracy</i>	<i>Introduce private sector practice and improvement performance in public sector</i>	<i>Enhance competitions</i>	<i>Reducing Size of the public sector</i>
Elements are relevant to PFI and BOT	Separate the politics and administration; De-politicises decision making and staffing; More flexible human resource management in public sector; Decentralisations on decision-making More information disclose on public service; enhanced citizen participation	Corporatisation; Budget management and discipline; Long-term, strategic planning, Lifecycle costing; Output and performance driven; Customer-oriented; Introduce private expert and specialists	Competitive neutrality; User paid, voucher, full costs recovery; Internal contracting: separation of production and provision; Deregulation public service market; Allow private sector to compete in provisions in public service and goods	Contracting-out; Outsourcing; Privatisation; PFI and BOT, Public Private Partnership; Downsizing size of public sector

Sources: adapted from Osborne and McLaughlin, 2002, Savas, 2000, Lane, 2000

However, in a PFI or a BOT project, the principal-agent problem still exists between public clients and private contractors. In the case of PFI and BOT (in theory), to some extent the principal-agent issue is less complex than in the conventional publicly-funded projects (which involve a number of principal-agent relationships among the public, politicians, officials, managers of public sector and private sector, etc.). Because PFI or BOT structural relationships between the public client and private contractor are simpler, the performance indicators and standards are better defined in the PFI or BOT contract. Finally, the performance-based payment system motivate private contractor working because the targets are set by the public clients. If targets are not met, penalties will be applied. In principal, if ‘transaction costs’ were not take into account, BOT and PFI may be a better approach to develop public infrastrucuture and servcie, based upon the

reasons mentioned above.

In terms of transaction cost economics, a BOT or a PFI will be neither a completely public nor a completely private firm. It locates between the two extremes of the private sector (the market) and the government (hierarchy). Both BOT and PFI engage the private sector to deliver services under the competitive bidding model, while they allow the governments to retain an ongoing interest in the delivery of public services. Therefore BOT and PFI can be deemed to be a 'hybrid' governance structure. The question is if the 'hybrid' governance structure would be better way to organize public services than the 'hierarchy' and the 'market' structures? There is no definite answer for this question. In transactional costs terms, a PFI or a BOT will be better only when it is 'cheaper' than other governance structures. The central matter here is the costs associated with PFI and BOT transactions. By looking into the dimensions and contributory factors of transaction costs (e.g. bounded rationality, opportunisms, uncertainty, incomplete contract, asset specificity and frequency of transaction), BOT and PFI may have very high transaction costs. When costs of a PFI or a BOT are higher than it organized through a hierarchical structure, in-house provision by the government would be better (e.g. small-size PFI projects, The Treasury, 2003).

Using the ideas of TCEs, the UK Treasury has build a tool named as the Public Sector Comparators to evaluate if the PFI should be adopted or not. The PSCs have been used to compare the costs of proposed PFI projects and the costs of conventional publicly funded projects (developed by government). However, the PSCs received lots of criticism and challenges, due to its inaccuracy in application (this will be discussed in chapter 3). One key point is that 'transaction costs' of a PFI can be underestimated; resulting in the PFI proposal always being cheaper than 'conventional projects' (Coulson, 2005).

1.2.5 From theories to practice: the critiques of the New Public Management and its application in China

The proponents of the NPM (e.g. Lane, 2000, Savas, 2000) argued a number of benefits of NPM have been brought into public management, such as cost efficiency and service effectiveness in the public sector. However, a range of critiques have arisen on the NPM and the theories that they are underpinning. Firstly, it is criticized that the NPM reforms

and the theoretical underpinnings ignore the differences between the public and private sector. The NPM focused too much on 'efficiency, effectiveness and economy' indicators in public services, undermining the importance of 'accountability and equality' of public services to the local communities. Also, the NPM reforms may focus on short-term gains (cost reduction and efficiency improvement), but undermined the capability of the state to take long-term perspectives. Secondly, the application of the NPM achieved some negative results. As Pollitt (2000) argued that the NPM has failed to deliver the promised efficiency and effectiveness of public services. Introduction of private sector in public infrastructure and services did not result in improvement of efficiency and quality of the services. Thirdly, as the strategies of the NPM, privatization and contracting out have been adopted in many countries. While the experience from the developing countries showed these reforms may promote self-interests and corruption of policy makers and bureaucrats opt for privatization and contracting out, increasing the opportunities of 'rent-seeking'. In addition, the transaction costs of the privatization and contracting out are very high, which result in the reforms being inefficient and wasteful. Fourthly, the public participation in the NPM is rare, although the NPM claimed the customer or citizen-orientation. Finally, a number of scholars have questioned the adaptability of the NPM in developing countries, since many attempts of NPM reforms have failed, particularly in the African countries. The key reason for the failure in the developing world is the governments may be irrespective of national contexts and institutional capabilities to carry out such reforms. As a developing country, it is hard to say China's economic and public sector reforms of the last three decades have been completely driven by theories which originated in the west. Unlike the UK's PFI 'top-down' approach reforms, many Chinese economic and public sector reforms are 'bottom-up' approach and are 'pragmatism' driven. For instance, BOT was introduced in the 1980s by the local government in Guangdong province to solve the practical matters of developing into local infrastructure. However, based on the policies' interpretations and detailed measures of Chinese reforms in the public sector, the decision-makers and politicians who advocated the China's reforms were affected by the practice of the NPM and the viewpoints of the public choice theory and principal-agent theory. Since the 1990s, the Chinese government has introduced some important reforms in public management (Naughton,

2007):

- China's public fiscal and taxation reforms (1994),
- state-owned banks' corporatisation and commercialisations (1995),
- restructuring, downsizing, commercialising and privatising state-owned enterprises (1994-2001),
- Chinese health, housing and education's 'socialisation' or 'marketisation' (1994-present)
- and Chinese central and local governments' institutional adjustments and downsizings (1998),
- the public investment reform in 2004,
- Finally, public utilities and infrastructure management reforms (2004-present).

All these measures have shown the governments hope to reduce their control on economic and social affairs, introduce 'marketisation' in the public service and infrastructure, decentralisation of decision-making in the public management to local governments and agencies at provincial and city levels, and deregulation of the private economy in the country. These reforms underpinned the concepts and ideas of the New Institutional Economics (Hassard et al., 2007). The results of these public sector reforms in China still remain unclear, although the government claimed that benefits have been achieved with some 'costs'. BOT as a sub-sector of these reforms also underpinned the ideas of the NIEs. This thesis will examine if BOTs have achieved the expected results and look at the problems that occurred along the way.

Through the above analysis, it can be seen that the BOT and the PFI are fairly similar model in financing social infrastructure and public service. The theoretical underpinning is also similar. China and the UK both face similar problems in developing their infrastructure and public service projects. Given the UK's role in developing PFI to an advanced stage, this study considers what lessons can be learnt from PFIs for developing China's social infrastructure and public services.

1.3 Lessons learning: A theoretical framework

There are four terminologies often involved with 'knowledge about how policies, administrative arrangements, institutions and ideas in one political setting (past or present) is used in the development of policies, administrative arrangements, institutions

and ideas in another political setting' (Dolowitz and Marsh, 2000: 5): policy transfer, policy diffusion, policy convergence (Bennet, 1991) and lessons-drawing. These concepts are of great relevance, developed by different scholars and widely used in different public policy and social studies in the last number of decades. Many researchers treated the 'policy transfer' as a broad concept or a label, including the terms of policy diffusion, convergence, lessons-drawing and a series of comparative studies in public policy and politics crossing countries and states. Evans (2004) believed that 'the contemporary study of policy transfer (broadly defined) originates from policy diffusion studies, a sub-set of the comparative politics in the U.S.A by Walker (1969) and Gray (1973).

Policy diffusion is commonly defined as 'the process by which an innovation is communicated through certain channels over time among members of social systems. It is a special type of communication in that the messages are concerned with a new idea' (Roger, 1995: 5). However, this term is used most often to internal policy transfers within a country. Also Bennett (1991: 220) suggests that diffusion refers to similar adoptions of policy without evidence of emulation.

Policy convergence (Bennet,1991) focuses on the comparative politics literature which identifies similarities across a number of countries in terms of policy goals, content, instruments, outcomes and/ or styles. There is the potential for convergence to refer to policy change which occurs relatively independently of other countries. In other words, countries with similar policy problems could address them in similar ways without there being policy transfer.

Policy transfer was developed and narrowly defined by Dolowitz and Marsh (2000) as 'the process by which knowledge about policies, administrative arrangements, institutions and ideas in one political system (past or present) is used in the development of policies, administrative arrangements, institutions and ideas in another political system'.

Rose (2007) defined 'Lesson-drawing is future-oriented, drawing on current experience in other countries to improve national policy.' It concerns itself with 'understanding the conditions under which policies or practices operate in exporter jurisdictions (countries) and whether and how the conditions which might make them work in a similar way can be created in importer jurisdictions (country)' (Page, 2000) .

By looking through these terms of ‘policy transfer’, it could be found that ‘policy diffusion’ and ‘convergence’ are not suitable for usage within this study. As mentioned in the last section, policy diffusion usually was used in internal policy transfer within a country rather than international policy transfer and lesson-drawing. Policy diffusion is a gradual process. Considering the concept of ‘policy convergence’, it involves in the ‘comparative policy or politics transfer’ studies without policy transfer. Many countries may face similar social and political problems; they adopted similar policies independently without any communication, without ‘any policy transfer or lessons-drawing’. In comparative studies, researchers called this process, trend or actions as ‘convergence’, some degree of ‘harmonization’.

While this research focus is on a policy (PFI) which has already been used in the UK, to explore how these experiences and lessons could be borrowed, for developing Chinese BOTs in the water and road industries in the future. Therefore, this research is a ‘cross-national’ study involving a ‘rational’ consideration on possible policy and lessons learning to improve a national policy (Chinese BOT) in China. Therefore, it could be said that the ‘policy transfer’ model (Dolowitz and Marsh, 2000) and lessons-drawing theory (2005) may be fit for this study. However, as commented by Page (2000), Dolowitz and Marsh’s (2000) and Rose’s model (2001, 2005) have different emphasis and considerations: Dolowitz and Marsh’s framework (2000) paid more attention when ‘on understanding the process by which policies and practices move from exporter to importer jurisdictions, above all the agents of policy transfer’. It concerns much on the processes of decision making in the importer country. Different from Dolowitz and Marsh’s framework (2000), Rose’s Lesson-drawing model (2001, 2005) tends to use cross-national experience as a source of policy advice by policy importer country. It not only addresses how policies operate in the policy export country, but also how they may be applied in the country of import and what modifications are needed to transpose between them. Furthermore, the lessons-drawing literature focuses on understanding the distinctive political, administrative, social, economical or cultural conditions that sustain cross-national policy differences.

This thesis is to draw the lessons, which are relevant to developing public services in China’s motorway and water industries, from the PFIs’ development and implementation in the UK over the last number of decades. Therefore, it needs to study

not only how PFIs worked in the UK, but also how BOTs operating in China under what kind of contexts and conditions, and eventually identify what policy and lessons may be borrowed for developing Chinese motorway and water BOTs. Therefore, the lessons-drawing model is certainly more relevant to this research. Rose (2007) described that ‘Lesson-drawing is future-oriented, drawing on current experience in other countries to improve national policy. It offers an evidence-based alternative to developing a new programme. It is evidence-based, since a lesson is based on programmes that have been operating for a long time elsewhere. Attention is focused on the measures that other countries employ to deal with a problem similar to one's own. It is based on experience, albeit the experience of other countries rather than one's own government.’ Also, he explained that, (Rose, 2007) ‘Lesson-drawing is about contingencies: under what circumstances and to what extent will a programme that works there also work here? It is about specifying ways of learning from foreign experience in order to develop a programme that can better deal with a domestic problem. The contingent nature of lesson-drawing specifies whether obstacles are variable (e.g. the economic priorities of the government of the day) or long-term (e.g. federal as against unitary institutions). It encourages policymakers to be sceptical about assuming that so-called ‘best practice’ policies can readily be adopted, but it also encourages scepticism about arguments that what is done there can never happen here...’ Under Rose's lesson-drawing framework, there are ten steps to draw lessons from abroad. The first step is identify the problems at home (diagnosing your problem). By investigation and reviews, the policy in the policy import country can understand ‘what is the problem’; this is the basic step of lesson-drawing. If there is no problem, there is no need to learn from another country. The second step of this model is identifying ‘where to look for the lessons’. Rose (2001) suggested when selecting a country to learn from, the following points need to be considered: 1) the ideological compatibility between the importer country and the exporter country; 2) similarities in resources: such as financial, personal and organizational capabilities; 3) psychological, not geographical proximity, for example national histories, culture's influence on both institutions and political values; 4) availability of evidence, especially the available reports, news and relevant information produced by governments, academics and organizations in policy exporter countries.

The third step is investigating how a programme works in exporter countries from different channels: official and unofficial, second and primary investigations. The fourth step is abstracting a cause-and-effect model for export, by review, abstract and summaries the elements of a programme necessary to make it operate, such as rules for action set out in laws and regulations, administrative requirements for delivering the programme, human resources for operating a programme or implementing a policy, possible financial costs and revenues and, finally, programme or policy recipients.

The following steps, from step five to step nine, concern the questions ‘what should be learned and could be applied by policy or lessons import country?’. As Rose explained that, based upon the understanding on specific problems in import countries and the programme already implemented in export countries, it is necessary to ‘design a lesson’ (step 5), and ‘decided if to adopt or not the lessons from abroad’ (step 6), if the lessons were chosen to adopt, then consider if the import country have necessary resources to apply the programme (step 7), furthermore, at the same time, it needs to address the national context influences (step 8), how and can a programme operate, and whether it may be effective. Step 9 is bounding speculation through prospective evaluation, considering contingencies and uncertainty in the future, finally using foreign countries as positive or negative symbols (step 10). See Box 1.4.

Box 1.4 Ten steps in lesson-drawing

- 1 learns the key concepts: what programme is and what a lesson is and is not
- 2 catch the attention of policy makers
- 3 scan alternatives and decide where to look for lessons
- 4 learn by going abroad
- 5 abstract from what you observe a generalized model of how a foreign programme works
- 6 turn the model into a lesson fitting your own national context
- 7 decide whether the lesson should be adopted
- 8 decide whether the lesson can be applied
- 9 simplify the means and ends of a lesson to increase its chances of success
- 10 evaluate a lesson’s outcome prospectively and, if it is adopted, as it evolves over time

Source: Rose, R., 2005, Learning from comparative public policy, a practical guide, Routledge, 2005, Oxon

1.4 Aims and Objectives of this Study

Transferring lessons learnt from policies in one country to another is a complex but not impossible undertaking (Rose, 1992, 2007, Page, 2000). Despite the benefits that could

affect to China, analyses of PFI in the UK with a view to identifying lessons for BOT in China, has not yet been undertaken. This study aims to look at the implementation of the PFI in the UK through another perspective, called the ‘lessons-learning’ approach. In this way, the first concern of this research is a critical review of how the PFI works in the UK, and to look at the lessons learnt from it. This research also required a diagnosis of the current problems of implementing BOTs in China. Only the problems of implementing BOTs were explored, this research therefore looks at what needs to be improved for the BOTs, based upon the PFI lessons. Certainly, not all the experiences and lessons from the UK are relevant to China’s BOT when the availability of resources and capabilities, as well as social-political and institutional contexts in China are taken into account. However the relevant ones can be identified. Finally, this thesis will make recommendations on improving BOT policy implementation, based upon the past experiences and lessons learned from the PFI.

There are a large number of studies on the implementation of PFI in the UK. PFI may bring certain benefits in developing public infrastructure and delivering public services. However, the problems and lessons associated with implementation also need to be studied. Only a small number of studies have addressed the matter of implementing BOTs in China’s motorway and water sectors, and there is no literature on how China can learn from the experiences of other countries. In order to do this, and informed by Rose’s model of lessons-learning, the first aim of this study will explore how the BOT model is operating in China. The second is to evaluate the problems that have been experienced by local authorities using BOTs to provide public infrastructure facilities and services. By collecting, analysing and interpreting up to date data relating to BOTs in China’s motorway and water sectors, it is hoped to:

- Learn how Chinese BOTs are operating within the contexts of the Chinese motorway and water sectors (the results, problems and obstacles of these applications);
- This study will also analyse literature surrounding PFI in the UK to understand how PFI has been developed, what problems have been experienced in the development and implementation of PFI and how these have been or are being addressed.
- The study will identify the lessons from the development and implementation of

UK PFIs relevant to China, in order to make better use of BOTs taking into consideration the context and conditions in China

- This thesis will make recommendations for China's utilisation of the BOT model within China's socio-economic context.

Due to BOTs being applied to a large number of sectors of the Chinese infrastructure over the last three decades (e.g. electricity generation, roads, ports, water, sewage treatment, heating supply, solid waste treatment, and with the new potential to be adopted into the education, health, housing, railway and defence sectors etc.), it is impossible to study BOTs in all areas. Therefore, this thesis will concentrate on the implementation of BOTs in China's motorway (including bridges) and water treatment (including sewage) sectors. Meanwhile, due to all BOTs being implemented by local governments at city level, this study then will focus on the implementation of BOTs from the perspective of governments.

1.5 The Structure of the Thesis

This thesis is divided into five parts. Part one is introduction. Part two reviews and critically evaluates the experiences and lessons of BOTs and PFIs in China and the UK through an analysis of earlier academic literature (chapter 2 and 3). Part three discussed the methodology used in the research. Part four is data analysis. It explores current practice in the implementation of BOTs in China's motorway and water industries through a mixed method which includes in-depth, semi-structured interviews, focus group and the observations of participants from the Chinese public sector. Part five discusses the relevance of British PFIs and Chinese BOTs, identifying the lessons and experiences that are useful to China's motorway and water industries, and making recommendations for improving the utilisation of the BOT model in China.

The thesis is organized into nine chapters.

Chapter 2	Explores the evolution of Chinese BOTs and identifies the limitations of current research in that area.
Chapter 3	Critically reviews and evaluates the experiences and lessons of British PFIs. The reviews are not restricted to matters regarding the adoption of British PFIs in the road and water industries, but also cover transport, health and education.
Chapter 4	Discusses the methodology, including data collection and analysis.

Chapter 5	Presents an overview of the data about Chinese road and water BOTs. Focuses on the results and problems from Chinese BOTs.
Chapter 6	Discusses the objectives and contextual factors influencing the implementation of Chinese BOTs, and attempts to describe the approach to implementation addressing contractual matters in particular.
Chapter 7	Brings together the findings and discussions, analysing the relevance of the UK and China BOTs and identifying the lessons that could be learned to develop Chinese motorway and water projects.
Chapter 8	Provides nine strategic rules for Chinese governments, to manage Chinese BOTs in future, draws upon the transaction cost theory.
Chapter 9	Presents the conclusions drawn from the research and provides suggestions for further areas of study.

PART TWO Literature Review

Chapter Two The Build-Operate-Transfer in China: A literature Review

2.1 Introductions

As discussed in chapter one, private participation in infrastructure is not a new idea in China. The first wave use of private capital to develop China's infrastructure can be found in the late 19th century. China's Ministry of Railway (2009) stated, in 1867, a British private company (Jardine Matheson Ltd., Shanghai) designed, built, financed and operated the first railway in China. Other forms of private financed infrastructure were also created in China at the beginning of the 20th century. Most of these were concession-based contracts and applied in the public transport sectors, e.g. railways and shipping. At that time, over 10000 kilometres of railway had been built in China by Chinese contractors with investors from the UK, France, Germany, Belgium, Russia and the United States by the start of the 'First World War' (The MOR, 2009). In those days, private participation in infrastructure in China was named 'Government-regulated, Private-managed Scheme' (in Chinese speaking 'Guan Du, Shang Ban'), a kind of concession-based project commissioned by the government in China.

The second wave of public-private cooperation was used in China between 1956-1961, under the Chinese Communist Party's (CCP) administration. A 'Chinese Nationalization Programme' was set up by the Chinese government to gradually eliminating the private economy in 1952. In this way, the government purchased majority stakes in Chinese private businesses, or paid a 'lease charge or interest' to capitalists for use of their factories and/or equipment. Through this kind of 'cooperation' between the government and private business, China's private economy was gradually nationalised by 1961. This Chinese nationalization scheme was called the 'Public-Private Partnership (Cooperation)', if translated into the English language directly.

The third wave of applying private participation in China's social infrastructure and public service started in 1986 (Wang *et. al*, 2000), when the first power station Build-Operate-Transfer (BOT) contract (Sha'jiao Power Station B plant BOT in Guangdong

Province) was finalized with a private investor from Hong Kong (Hopewell Ltd.). In this project, Hopewell Ltd. was responsible for designing, building, financing and operating a power generation plant, while the Guangdong provincial government promised to buy all 'output' through a BOT contract. When this 10 years contract was finished, Hopewell transferred the power generation plant back to the governments for 'free'. From 1986, government in China started to use the BOT model to attract foreign private capital investments urgently needed, and also began to explore new approaches to develop Chinese infrastructure and public services (Handley, 1997).

To date, China has been the world leader in the use of private finance in infrastructure, in terms of signed PPP and BOT projects and capital values, according to the Private Participation in Infrastructure (PPI) department (2010) of the World Bank's statistics. However, the application of BOT in China met many challenges (Fu, *et.al* , 2006, Qin and Yu, 2005, Wang and Ke, 2008). This chapter reviews the BOT development in the China since 1986 based on previous reports. It hopes to explore the following questions:

How BOT is defined and organised in China?

What are the objectives or rationales of utilising BOTs in China's infrastructure and utilities industries?

What is the history and the background of using BOTs in China?

What have been the experiences of implementing BOTs in China to date?

What debates and problems have arisen in the implementation of Chinese BOT programmes?

This chapter is organized into four sections. Section 2.2 interprets the basic concepts, models, arrangements and policies of Chinese BOT in order to compare them with British PFI in later chapters. Meanwhile, it also looks at the basic structure, frameworks and stakeholders of Chinese BOT programmes. Section 2.3 reviews the history of the uses of BOTs in China since 1986. It emphasises the ideologies, contexts, rationales and problems of applying BOTs in China, as well as the key facts related to the BOTs.

Section 2.3 also looks at the earlier use of BOT in the period of 1986-1994, 1995-2001, to find out the history, rationales and background surrounding the implementation of China's BOT programme. Then this chapter concentrates on the applications of BOTs in China between 2002 and 2008. In Section 2.4, the main debates and arguments surrounding BOTs in China will be reviewed, although a limited number of studies have been done so far.

2.2 Explaining BOT in China: Definitions, Models and Arrangements

2.2.1 *The definitions and models of Chinese Public-Private Partnerships (PPPs) and BOT*

Build-Operation-Transfer is one popular method of Chinese ‘Marketisation’ or ‘Socialisation’ reform of public infrastructure and social services. ‘Socialisation’ was defined by the National Development and Reform Commission (NDRC, the former State Planning Commission, SPC, 1995) as, *‘the social investments or non-government capital (investments) in unrestricted infrastructure, public welfare, and other (public service) fields’* (NDRC, 2004, Chapter 2, Clause 5¹). It includes various models, such as: *‘solely funded undertakings, joint ventures, cooperatives, joint management projects and financing modes’* in infrastructure projects that included investment by the private sector (NDRC, 2004, Chapter 2, Clause 5).

Private capital and investment are welcomed into Chinese public welfare undertakings and infrastructure projects by the government, unless there are clear restrictions on private investments in the *Catalogue of Investment Projects Authorized by the Government* (Ministry of Construction, MOC, 2002, NDRC, 2004). The ‘Marketisation’ was often used in the Ministry of Construction’s documents. As the Ministry of Construction suggested in the *Opinions on Acceleration of Marketisation Process of Public Facilities 2002* (MOC, 2002), *‘Local governments should accelerate the progress of marketisation on public utilities industries, to encourage social and foreign capital to participate in the public utilities’ projects, through varied use of models, such as BOT, Transfer-Operation-Transfer (TOT), joint venture and other forms of cooperation between public and private sectors, for instances, the Asset Back/Based Securitisations (ABS) model.’*

The statements above show that the concepts of ‘Socialization’ and ‘Marketisation’ in

¹English Version can be accessed at http://en.ndrc.gov.cn/policyrelease/t20060207_58851.htm

China are quite similar to the British PPP, which involved all kinds of cooperation and collaborations between private and public sectors. Therefore, the term PPP is also used in some recent Chinese academic studies (Qin and Yu, 2005, Fu, et. al., 2006). This is because the authors believed the concept of the PPP from the UK can be used properly to define and interpret all the activities of private participation in the infrastructure industries in China.

The most popular model of private participation in Chinese public infrastructure is Build-Operate-Transfer (BOT). It was defined and explained in the BOT Circular in 1996 (The State Planning Commission, 1996) as follows:

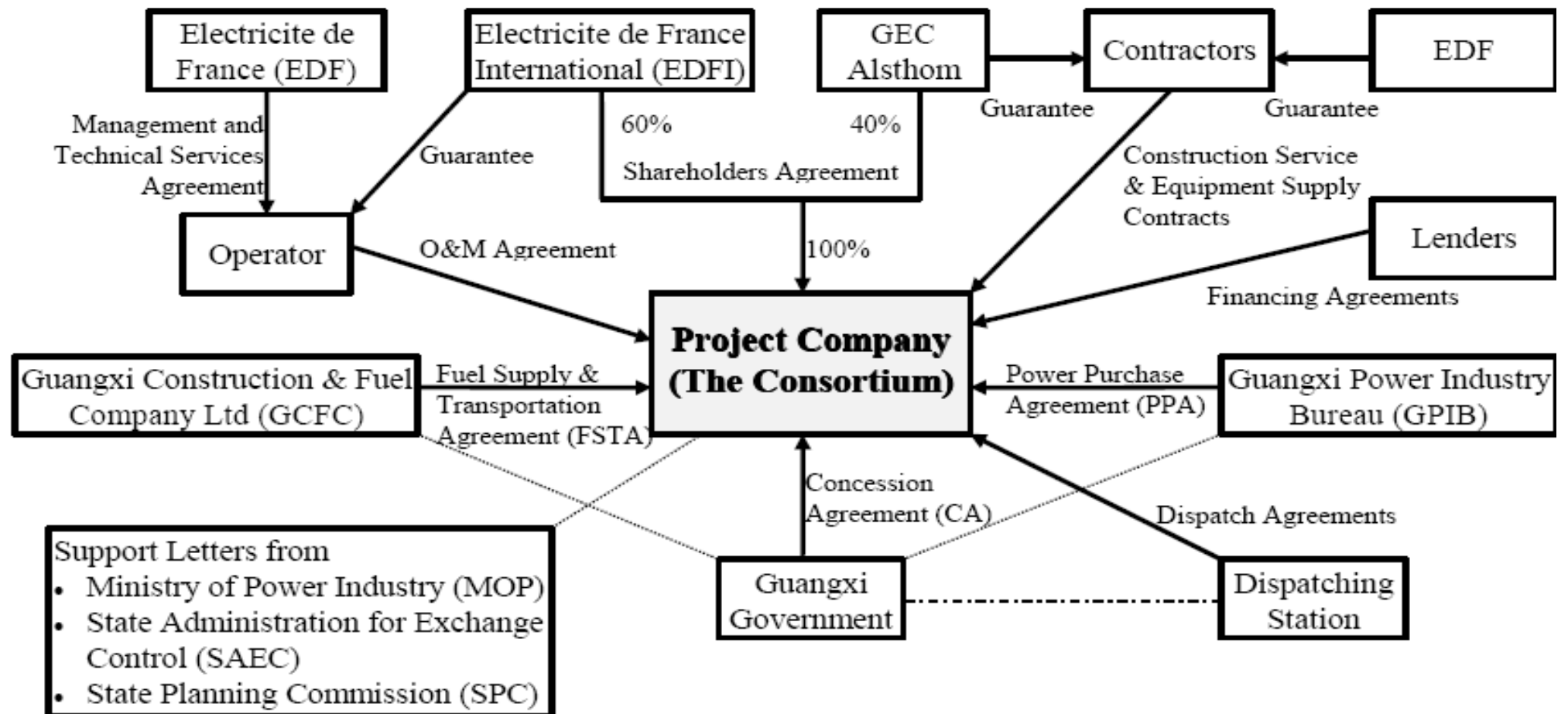
'BOT projects as used in these Provisional Regulations shall refer to the infrastructure projects built, financed and operated by foreign investors. A government authority may, through a franchise agreement and within a specified period, authorize a BOT project to a project company established by a foreign investor particularly for such BOT project, and have the project company responsible for its financing, construction, operation and maintenance. After the expiration of the franchise period (normally no more than 30 years), the project company shall transfer the entire facilities of such BOT project to the government authority in good condition and without any claim'.

BOT was also similarly defined by the Ministry of Construction (MOC) in 2002 and 2004. However a notable change associated with BOT policy was that the Chinese domestic investors were allowed to build, finance and operate the infrastructure projects from 2001.

2.2.2 The structure of the BOT in China

The Chinese BOT model seems more complex than the traditional public-funded projects in China. This is mainly due to the complex contractual relationships between the private contractors and public clients, as well as the complicated relationships between the members of the *Project Company* (called a *Special Purpose Vehicle* in the UK). A BOT project normally includes a number of stakeholders from private and public bodies such as, project contractors, construction sub-contractors, operation and maintenance subcontractors, lenders, suppliers and finally the financial and legal advisors. Therefore, there are big challenges for both the public authorities and the private contractors to manage these complicated relationships in complex mega-projects. As Wang and Ke (2008) commented, a critical success factor of a BOT project is whether the public client and the project contractor can properly manage the complicated relationships and integrate the different people together. Although few of the official documents mention how a BOT should be exactly organised, some case studies of the Chinese BOT presented the basic structure of a BOT (Wang and Ke, 2008, the World Bank, 2003, Qin and Yu, 2005). The structure of a Chinese BOT has been presented in diagram 2.1 on next page. The case is from a power station BOT project—the Lai’bin City Power Station in Guang’xi Province. It was the first pilot BOT project and was organised and directed by the State Planning Commission (central government) in the mid-1990s. This project was undertaken by the joint venture of Electricite De France (EDF) and GEC Alsthom and the senior debtors were also two French banks and the EIB (European Investment Development Bank). In this project, at least 13 stakeholders from China and France participated, and more than 15 contracts and guarantee arrangements were involved between the different stakeholders. The Lai’bin BOT model was a flagship and this standard model has been used in other BOT projects in different industries in China. In addition, another two pilot projects designed and managed by the State Planning Committee also adopted similar BOT frameworks.

Diagram 2.1 The Structure of Lai'bin B Power Station BOT project, Guangxi Province, China, 1995



Sources: Wang and Ke, 2008

The complexity of BOT projects in China also stems from the complicated approval and procurement procedures, see page 40, table 2.2. The BOT projects with capital value over US\$30 million required three levels of government approval and review, which included: State, Province and City government. According to the World Bank (2003), Chen and Messner (2003) and Zhang's (2007), before 2005, a proposed foreign-privately-financed BOT project would be required to get at least 30 approvals from various departments at the central and local government and each approval required a different criteria to be met, such as macroeconomic planning, foreign-investment policy, commercial registration, sector regulation, foreign exchange, taxation, land administration, sanitation and environmental protection, customs, and construction etc.

Meanwhile, Chen and Messner (2005: 927) argued that 'each regulator operates under different and sometimes conflicting policy constraints. This made the project approval procedure difficult and full of uncertainties either to the sponsoring government agency or to bidders/concessionaires'. To resolve these issues, the government (the NDRC) in China simplified and decentralised the right of approval for BOTs to local governments in 2004, in order to reduce the time and expense of the private investors' BOT applications. However, the experiences in the post-2004 period showed that local governments in China could not perform these roles very well. The reviews and evaluations on BOT cases, proposals, and applications were managed poorly which, led to many unqualified BOT applications being passed (Zhang, 2007).

Table 2.2 The process of implementation of BOT

<i>Steps to for BOT projects</i>	<i>Details</i>
1. Clarify objectives by establishing business	An initial feasibility study report should be designed to: Study feasibility of the projects; Identify objectives and scales of the project; NOT include project's details, e.g. technical matters, project cost-benefit analysis and possible Return on Investment
2. Approval (by the 12 departments at provincial level, if international investors, need further 12 departments at central governments) Above two steps need 6-12 months	To gain the BOT approvals from the provincial governments (and the central governments if needed), the procuring authorities at city and county level need submit: Outline business cases; And the report of initial feasibility study. For the BOTs proposing to use international investments, the application should be approved by the governments at national level, e.g. NDRC For Chinese domestic investors, application should be approved by the provincial governments.
3. Prepare tendering 4.5 months	Assemble tendering office and team, include: members and experts from the procuring departments, planning, finance, tax, land management, price management, construction department etc. Introduce consulting firms (financial, legal and technical); Detailed study on technical issues, identify technical standards (engineering problems, equipments, technical standards and environment protection); Design project structure and indentify relevant conditions for implementation of projects; Design pre-qualification documents and standards; Prepare tendering documents, identify tendering evaluation standards and key clauses of BOT contract (output specification); Invite bidding through advertisements on three national media
4. Prequalification of bidders 1-1.5 months	Identify bidders
5. Preparing bidding documents by (the bidders) 5 months	The bidding documents should include: The detailed descriptions on BOT facilities, product or services; Construction arrangements and plans; Production or service unit price; Contract standards: quantity, quality and life cycle costs Possible Return on Investment and financing structure; Foreign exchange arrangement (if international investors); force majeure arrangement; maintenance plan; Risk identification and allocation
6. Select bidders 1 month	Financial and NPV analysis Taxation arrangement and inflation consideration Risk transfer and allocation
7. Negotiation with preferred bidders At least 4 months	Financial arrangements (financiers) Subcontractor: construction, Hard facility and soft facility Suppliers Insurance
8. Finalise BOT contract	Draft BOT contract

3-4 months	Bidder's Full Business Cases, Final agreement with stakeholders, Final BOT contract
9. Project design, construction and operation	Implementation of project (with the government evaluation)

Source: Da Yue Consulting Firm, 2009; Zhongyi Consulting Firm, 2004, Zhang, 2007, Qin and Yu, 2005

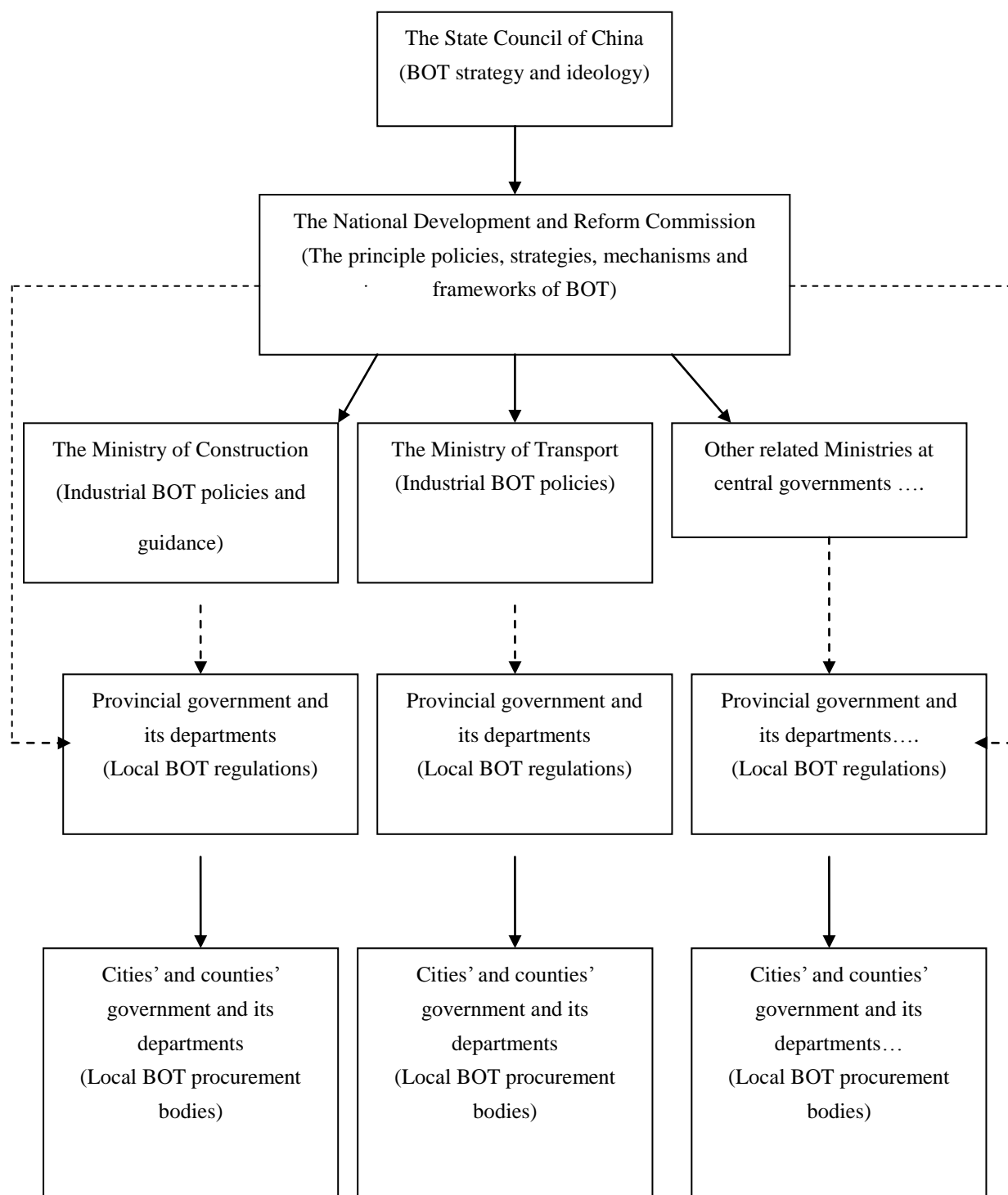
2.2.3 The Policies and governing frameworks on China's BOT

Up to 2010 only a few strategies, policies and regulations governing BOT had been issued by China's government. The current BOT policies and regulations may be classified into different levels according to the matters they concern. The first level of the Chinese BOT policy was actually the interpretation of the official ideologies and strategies, like the State Council's official policies (the State Council, 2005, 2010) on developing the private economy in China. These documents did not contain the detailed instructions of the BOT programme, but instead the central government officially acknowledged the ideologies, opinions and national strategies of the government on developing public infrastructures and services through private finance. At the second level, the key policy and official documents addressed the guidance of the BOT schemes, upon the ideologies and strategies of the State Council set out in the first level. These policies or regulations concern: what the BOT model is and what are the principles of using private financed programmes. They also look at what the key arrangements and mechanisms in developing a BOT contract are etc. These documents were usually issued by the NDRC (The SPC, 1995a, 1995b, 1996) to define the basic concepts and arrangements involved in a BOT framework, including a few detailed guidelines on the BOT in practice. The third level of China's BOT policies are issued by the national ministries in central government and concern matters of implementation, in terms of the industries and sectors. Some guidelines on using BOT methods in public utilities industries have been published by the MOC in 2001, 2002, 2004 and 2005.

Finally, at local level, the provincial, cities' and counties' authorities can also issue their own regulations on developing BOT projects, such as the BOT Regulations and the Opinion Letters issued by Beijing, Hebei, Guizhou and Xinjiang Provincial governments after 2005. The local government as the main procuring body and inspector of public

infrastructure and services has addressed a number of issues when a BOT is adopted, such as procurement and tendering, performance of construction, output of the BOT projects' operations, and the reviews of private contractors' performance. The structure of China's BOT policies and government framework is shown in diagram 2.3.

Diagram 2.3 The structure of the China's BOT policies and governance's framework



Sources: The Collections of the policies on China's public utilities reforms (2006), Fu, Chang and Zhong, 2006

2.2.4 The policies of Chinese BOT

The earliest official policies on China's BOT were issued by the State Planning Committee in 1995 and 1996. The most important BOT policy in China—The BOT Circular (1996) was designed by the State Planning Commission and enforced in 1996 to define and explain the important arrangements and mechanisms of BOT projects in China. This circular included the payment mechanism, the approval process, the procedures and methods of procurement and tendering (international competitive tendering), formats and contents of the BOT contracts, the roles and responsibilities of public procuring bodies and the BOT project company (Special Purpose Vehicle), and finally the risk sharing arrangement. The BOT Circular (SPC, 1996) has been treated as the basic legal document for the Chinese BOT projects, as it was originally prepared as the draft of China's BOT Law at the time.

However, the BOT Circular (SPC, 1996) received strong (political) opposition and suspicion at the wider consultation stage in the People's Congress (the Parliament) in 1996. Also, the Circular only allowed foreign investors access to the Chinese power station, motorway and water supply markets, and excluded Chinese domestic investors. Finally, there were some serious flaws and arguments detailed in clauses of the BOT circular (The World Bank, 2003). Therefore, the State Planning Commission quickly withdrew this draft proposal, instead of issuing it as an administrative regulation. However, two big modifications have been made in the last ten years to the BOT strategies and policies: Firstly, Chinese domestic investors have been permitted to invest in BOT projects what used to be foreign investor only (SPC, 2001, *Circular of Committee of Planning concerning promotion and instruction of private investment*). Therefore Chinese domestic private investors started to explore the PPP and BOT markets as new entrants and competitors. In recent years, they have already become active in a large proportion of the Chinese PPP market as discussed below.

Secondly, there was a big reduction and simplification of the procedures for BOT application and approval, by decentralising to provincial and city governments in 2004. The approvals and reviews on Chinese BOT' applications are not conducted by central

government any more, as the NDRC (2004, Chapter 2, Clause 1) explained: ‘(Central) Government approval will no longer be required for projects not funded by the government. Instead, the systems of ‘Authorization’ and ‘Record-filing’ will be used where appropriate. Projects not using state funds will only need governmental authorization for important and restricted investment projects relating to public or social interest (e.g. national defence). For other projects without state funds, no matter how large the scale, the applications only need to be put on record. And enterprises will make decisions on market prospects, economic benefits, source of capital and product planning; and take on risks themselves.’

Also, in 2005, the State Council (2005) issued guidelines for developing the private economy in China, (the so-called ‘36-clause on the non-public sector’ 2005) officially allowing private companies (including domestic and foreign enterprises) to invest in previously restricted sectors dominated by SOEs. In Clause 3 of this document, the central government suggested that public authorities should allow and actively encourage non-public capital into the public utilities and infrastructure fields, especially urban water supply, gas supply, heating supply, public transport, and sewage treatment. This policy in 2005 primarily removed the market restrictions on public utility industries for Chinese and international private investors.

Moreover, the most recent policy related to the private sector participating in public infrastructure and social welfare was issued by the General Office of the State Council of China in 2010 (*Several Opinions of State Council on Encouraging and Guiding Healthy Development of Private Investment*²). This fundamentally widened the fields and scope of the use of private finance in all industries and public service sectors in the country. This document removes entry restrictions on public health, education, social housing, railways, high-speed railways and defence completely for Chinese domestic private investors and partially for international investors. Although the detailed policies and regulations have not been published by the related ministries or provincial governments yet, it can be predicted that the scope of applications of BOT in China will be much wider than before.

² English version is available at: <http://www.lpacn.com/news/details.aspx?id=2010613110643>

The main areas opening to the private sector are shown in table 2.4.

Table 2.4 The fields and industries open to Chinese private investors and Foreign investors after 2010 (General Office of the State Council, China, 2010)

Industries	Investment Resources	Private Investment Restrictions	Foreign Investments
Communication & transportation	Construction of grid of national trunk railways	No restrictions	Chinese partner shall hold the majority of shares (China Majority)
	Construction of grid of feeder railways and ferry facilities	No restrictions	limited to equity joint ventures (EJV) or contractual joint ventures (CJV)
	Construction of civil airports	No restrictions	China Majority
	General aviation companies for agriculture, forest and fishery	No Restrictions	EJV or CJV
	Intercity rail transmit	Construction (Share participation)	Comprehensive maintenance of intercity rail transmit(China Majority)
Energy	Production of biology liquid fuel (fuel ethanol, bio-diesel)	No restrictions	China Majority
Mining	Exploration and development of resources	No restrictions	Some minerals such as tungsten, molybdenum, tin, antimony, fluorite, rare earth and radioactive minerals are prohibited. Most of the others are limited to EJV or CJV or China partners holding majority
Public Utilities	Construction and management of fuel gas in big city, heating power and water supply and sewage networks	No restrictions	China Majority
	Construction and management of metro and city light rail	No restrictions	China Majority
Health care service	Hospital	No restrictions	EJV or CJV
Education	Common high school education	No restrictions	EJV or CJV
	Institution of compulsory education	No restrictions	prohibited

Source: Several Opinions of State Council on Encouraging and Guiding Healthy Development of Private Investment, English version at, <http://www.lpacn.com/news/details.aspx?id=2010613110643>

Through a review of the related policies of the Chinese government since 1995, it can be

seen that the market entry restrictions on private financing of infrastructure and welfare service projects have been continually reduced. More and more social infrastructure and public service fields have opened up to Chinese domestic investors. Meanwhile, the devolvement of BOT approval and application from central to local government in China simply reduced the time and costs of implementing BOT projects. The government, including the General office of the State Council, MHURD (Ministry of Construction) and the NDRC, have clearly shown their reference for market-based, efficiency-focused and competition-dependent approaches in a number of their guidelines and official interpretations on the policies, see Table 2.5, page 49.

However, for BOT policies in China, the big issue is that detailed guidelines have not been designed and published by related ministries and local governments on how to use these programmes in practice. Although the broad framework of BOT policy is clear, detailed guidance on implementation is still vague. Only the Ministry of Construction (2004) has issued some basic guidance to local authorities who want to use BOTs for projects. For instance, five Standard BOT Contract Models for urban utilities projects were designed and issued by the MOC in 2004 and 2006. However, when reviewed the BOT contract models designed by the MOC are 34 pages or less. Although these models covered basic areas and arrangements of the BOT transactions, they are too simple and too ambiguous to use in practice. At the same time, the Ministry of Construction are aware of the matters regulating BOT projects in previous cases (MOC, 2004). Therefore, the MOC (2004) required that local authorities should regularly review the performances of BOT contractors every two years, and recommended that the results should be open to the public. However, this is not a compulsory requirement for local governments, therefore no such performance review reports on BOT projects, have been issued by local authorities so far. In addition, the MOC's policy is too vague to implement, since it neither explained or presented details of regulating problems previously experienced in projects, nor did it give detailed standards on conducting evaluations on BOT project' performance.

Finally, there are no guidelines for power and transport BOT projects, issued by the State

(Electricity) Grid Corporations (Former, Ministry of Electricity) and the Ministry of Transport (Transport BOT projects), although the BOT projects in these two industries made up over 70% of the overall market in China.

Table 2.5 Chinese PPPs and BOT Policy Framework and the adjustments between 1995 and 2010

<i>Date</i>	<i>Title</i>	<i>Content relevant to PPP/BOT</i>
1995	Circular of the Ministry of Foreign Trade and Economic Cooperation: Concerning Absorption of Foreign Investment by Means of BOT (Ministry of Foreign Trade and Economic Cooperation, 1995)	These are two particular policies to regulate BOT. These two policies are the legislative platform for the first BOT project in China: Laibin B Power project.
1995	Circular concerning approval of foreign investment concession project (promulgated by State Planning Commission, Ministry of Power, Ministry of Transportation, 1995)	
1996	The BOT Circular: Temporary measures of foreign investment in concession (BOT) project (the State Planning Commission)	Particular regulation for BOT, but it was developed and based the two Circulars issued in 1995
2001	Circular of concerning promotion and instruction of private investment (the State Planning Commission, 2001)	This policy showed that the domestic private sector is permitted to invest in sectors where foreign investors have rights to invest in, thereby the Chinese domestic investors were allowed into China's infrastructure markets.
2002	the Opinions on Accelerating the Marketisation of Public Utilities (Ministry of Construction, 2002)	The government officially kicked off the marketization reform of public utilities sectors; it was emphasizing the importance of the market and expecting to bring in much needed investment to increase efficiency through the involvement of private sector.
2004	Catalogue of Investment Projects Authorized by the Government (National Development and Reform Commission, 2004)	Outlines the list of industries which foreign investors are encouraged, limited or forbidden to invest in. Most of the urban utilities industries, power station, road industries are in the list of.
2004	The method of managing urban public utility concession (BOT) (Ministry of Construction, 2004)	Specified policy for urban public utility. Set up the range of concessions, the conditions for bidders, the framework of concession content and the

		timescale.
2004	Decision on reforming the public investment system (2004) (the General Office of The State Council, but implemented by the National Development and Reform Commission, 2004)	Encourage private investment for infrastructure, public facilities and other sectors which are not forbidden by law. Encourage private participation in profitable public infrastructure projects by way of own investment, joint venture and project finance (BOT). The private investments in form of BOT model do not need the approvals of the SPC (NDRC).
2005	The opinion of the State Council regarding the encouraging and support for the development of non-state-owned economy (privately-owned economy) (Non-government-owned economy, old 36 clauses) (State Council, 2005).	First central government policy allowing the entry of the private sector into the area of power, communication, railway, airline and petroleum. Furthermore, the opinion asked for the improvement of legal aspect to support the private sector's investment, construction and the operation (BOT) in the public infrastructure. Non-governments investments did not need the approvals from the NDRC anymore.
2005	Opinions on Strengthening Regulation of Public Utilities (Ministry of Construction)	Urging public authorities to strengthen regulations and reviews on the performance of public utilities' projects, mainly focusing on the BOTs projects. The governments were required to issue performance review reports regularly and disclose these to the public.
2010	Several Opinions of State Council on Encouraging and Guiding Healthy Development of Private Investment (this policy also contained 36 clauses and focused on the private economy development. It was called the non-government-owned economy policy, new 36 clauses)	First central government policy allowing the entry of the private sector into the fields of social housing, education, health and defence industries, especially for Chinese domestic investors, Almost all of infrastructure industries and welfare services markets will be opened to them.

2.2.5 The official rationales for the BOT programme

By reviewing the official strategies and policies related to China's BOTs, some keywords often appeared in these official documents, such as 'Marketisation', 'Private Economy', 'Created Competition' and 'Improving Efficiency'. Although the government has not clearly recognised the objectives for the Chinese BOT programme, based on the interpretations and claims of the official policies, the main aims of these schemes can be summarized as follows:

Firstly, The Chinese government hoped to introduce private investments into public infrastructure and utilities to accelerate the development of public infrastructure and services that currently had under-investment (NDRC and State Planning Commission, 1995, 1996, 2004, MOC, 2004, State Council, 2005, 2010). Secondly, by mobilizing private investment capital, the government in China expected to diversify the source of, and options for, public investment areas that were solely dominated by the state in the past (NDRC and the State Council, 2004, 2005). Thirdly, through the private financed infrastructure and utilities projects, the government claimed that private investments could break the monopoly of the state in the infrastructure and utilities' sectors, thereby increasing efficiency and improving performance in the public service. Fourthly, private financed projects introduced competition in these markets and ultimately promoted the constructional operational performance of public projects (NDRC and the State Council, 2004, MOC, 2002, 2004). Fifthly, by using BOT schemes such financing methods based on the market mechanism improved resource allocation and investment decision-making in public infrastructure and services investments (NDRC and the State Council, 2004, MOC, 2002, 2004). Finally, the uses of BOT can directly improve the living conditions of local people and indirectly create new commercial opportunities for local markets (MOC, 2004, The State Council, 2005, 2010).

By reviewing the government's claims for Chinese BOT initiatives, it can be seen that earlier BOT documents and policies put more emphasis on introducing private finance into public infrastructure and services projects before 2004 (i.e. the first of the rationales mentioned above). However, the focus of the government has gradually changed to the efficiency of the BOT projects from 2004. There are still some questions that have not been

discussed in previous BOT studies in China and need to be clarified by the government as important condition for using BOTs:

- Are the marketisation strategies suitable for the public infrastructure projects, given their natural monopoly status?
- Did it improve the efficiency and responsiveness of delivering public facilities and services as the government anticipated?
- How could competition be introduced into the public infrastructure industries by the BOT programme?
- Given that the current regulation and supervision system for BOT projects has not been fully established by central and local authorities in China, how could the government assure that public interests will not be damaged by the implementation of BOT projects? This may be more important, as a major rationale for state provision of services is that private markets allocate resources inequitably in a market economy, BOT in China adopted an idea of ‘you get what you pay for’. This matter may be more vital in health, education and housing services, which may be still deemed as the ‘responsibility’ of the state in China.

In addition, the government in China needs to consider or identify if there are favourable or unfavourable circumstances to success of BOTs in China:

- Are there sufficient qualified investors, constructors, banks and consulting firms in China able to finance, operate and maintain the public infrastructure and services projects?
- Do the local authorities in China and their staffs have enough capability, experiences and skills to carry out BOT *projects*?

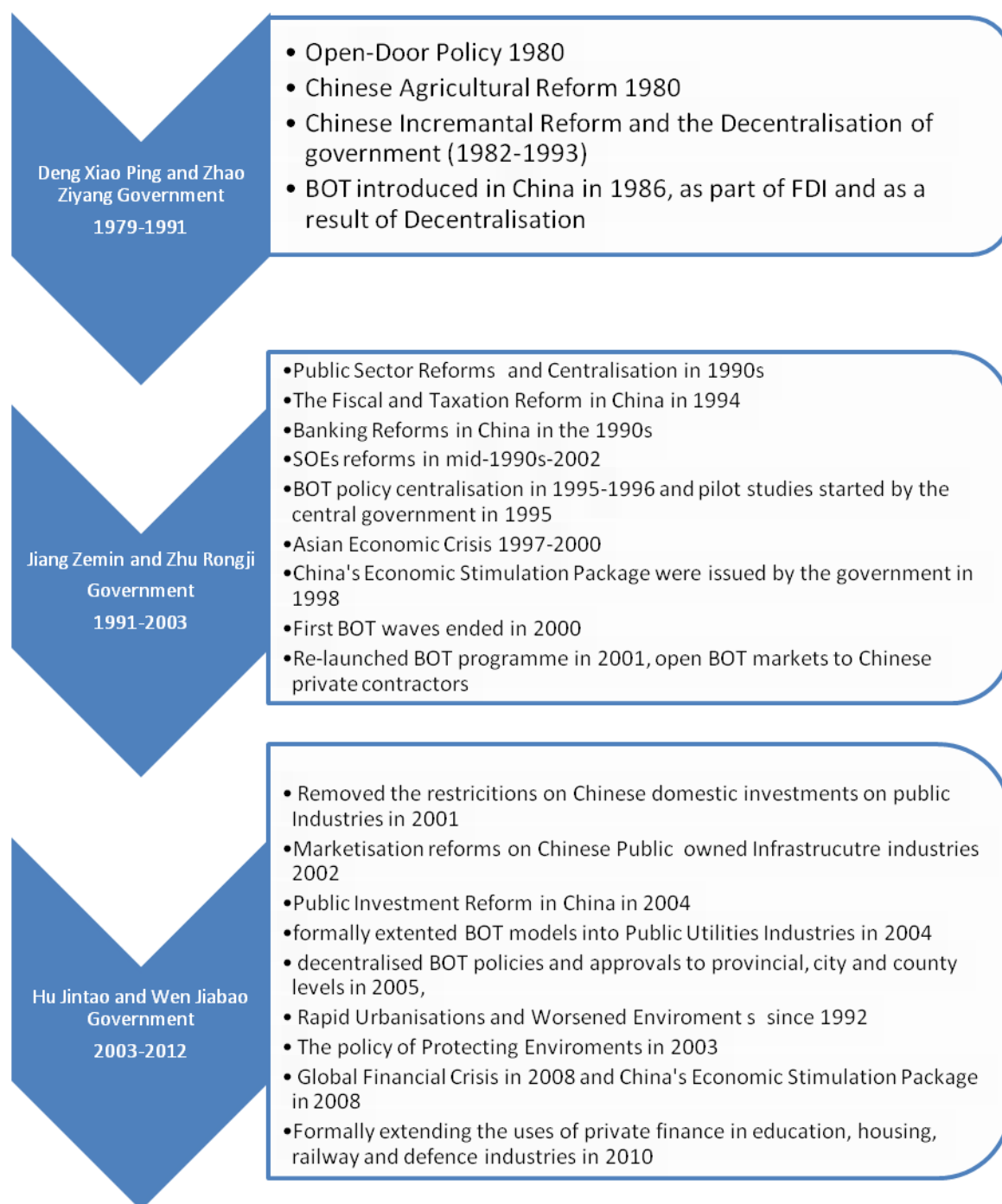
The next two sections will review the rationales, context and histories of implementing Chinese BOTs in the period 1986 to 2008. It will discuss the performance of the BOT programmes in China, based on the previous studies.

2.3 Application of BOTs in China: Contexts and histories in the period of 1986-2008

2.3.1 An introduction: the political, economic and social contexts of China's BOT programme

Before reviewing the history of the implementation of Chinese BOT, it is better to look at the changes in China's political, economic and social spheres in the three last decades, to understand the contexts and circumstances of how BOTs operated. Broadly speaking, the inception and development of the BOT programme in China has been inevitably affected by Chinese economic and public sector reforms, and social changes since 1979. Notable examples are the Chinese 'open door policy' (from 1979), 'Chinese Socialist Market Economic Strategy' (from 1992), and a series of Chinese public sector reforms in the 1980s, 1990s and 2000s (e.g. China's fiscal and taxation reform in 1994, China's public SOE reform since 1997, China's investment reform in 2004, Chinese public utilities marketisation since 2004). Meanwhile, the great changes in Chinese society were also main drivers of applying BOT, such as the extremely fast urbanisation, increasing demands on basic public facilities (e.g. electricity, water, gas and road), and worsening Chinese environment. However, successfully utilising BOT in China is a difficult task for the government and private contractors, since BOT itself is a complex method of financing infrastructure. A number of contextual variables may be the obstacles of utilising BOT programmes, for instance, the under-developed Chinese legal system and poor BOT policy and regulatory frameworks. Finally, it has to be noted that although the policies and regulations of BOT have changed several times due to Chinese contextual factors since 1986, the strategies of governments on encouraging private investment in China's infrastructure and social services have never changed. The main reforms, events and facts are presented in Diagram 2.6.

Diagram 2.6: BOT Policy development in China's context: 1979-2010



Sources: adapted from Zhang, 2007, Qin and Yu, 2005, Wang and Ke, 2008, Adams, et. al., 2006, and Fu, Chang and Zhong, 2006

As many previous studies on Chinese BOTs stated (Zhang, 2007, Qin and Yu, 2005, Wang and Ke, 2008, Adams, et. al., 2006, and Fu, Chang and Zhong, 2006), the programmes of private participation in Chinese infrastructure had not developed as well as the government expected. The programmes were also largely affected by the international political and economic events, such as the economic crises in 1997 and 2008. Similarly China has experienced boom and recessive trends in BOTs since 1986. Considering together all of the domestic factors, contexts and policies, BOT development in China can be categorized into three stages (Wang and Ke, 2008): the first stage covers the period from 1986 to 1994, when BOT applications increased rapidly from 1986 at local level, especially in Guangdong province and the Special Economic Zones (SEZs). The second stage covered from 1994 to 2001, and, during this period, only a limited number of infrastructure fields were open to foreign investors. All the BOT projects were strictly managed and supervised by the central government, especially by the State Planning Commission of the State Council in China. However, due to the Asian Financial Crisis of 1997 and 1998, international investors stopped applying for new BOT contracts in China and largely withdrew their existing investment. Instead public funds were injected into the infrastructure area under the Economic Stimulation Package of China in 1999. Furthermore, the central government also started to cancel local 'illegal' BOT projects. Illegal BOT projects referred to projects applied for in the form of a BOT model by provincial, city or countries' governments, but had not been approved or reviewed by the State Planning Commission of the Central Government at the time. Negative factors on China's developing BOT markets led to both the capital values and the number of the BOT projects declining sharply in the period of 1998-2001. Due to the contextual changes and the start of reforms on China's public-owned utilities industries, BOT schemes were re-launched by the government in 2001. The government widened the scope and scale of using BOTs. Therefore, the third stage of the uses of BOT in China started in 2002 and finished in 2009.

2.3.2 The Application of BOTs in China (1986-1994): Open-door policy and decentralisation in the Chinese public sector

The process of economic reform in China started in the late 1970s. By reviewing the development of other East Asian countries and regions (e.g. Hong Kong, Taiwan and Singapore), China contingently drew lessons and revised its reforming strategy in the 1980s (World Bank, 1993). China's reforming strategies priorities export and foreign capital inflow as other East Asian countries had done (Naughton, 2007). To attract foreign investment and to allocate capital in 1980s, the Special Economic Zones (SEZs) were built for using radical policies to develop the Chinese private and foreign economy. The emphasis of these reforms was to develop an export-oriented economy in China's coastal area. From 1980, China attracted a large amount of Foreign Direct Investments (FDI), including investments from the EU, Japan, Singapore and Korea, but Hong Kong was main source of 'foreign' direct investments in China at this time (Hong Kong was a colony of the UK) (Naughton, 2007). The FDIs in China mainly focused on export-oriented manufacturing industries for using available Chinese cheap labour, materials and resources (Long, 2003). While as Handley (1997) showed, foreign capital also actively participated in developing Chinese infrastructure projects. A number of infrastructure projects were designed, financed, built and operated by FDIs. Most of these projects were located in SEZs and the Coast Open Cities by Hong Kong investors.

The rationale of the use of BOT was that the SEZ governments expected to build a complete infrastructure system in locally to attract more and more foreign investments. However, such investments were expensive and exceeded the financing capabilities of the government . Handley's study (1997) of the 1980s and 1990s, showed that several Hong Kong infrastructure developers had actively participated in a number of BOT projects in China and other East Asian countries, Hong Kong's private infrastructure developers had lots of experiences financing and managing public infrastructure projects, including China Light and Power which has been providing electricity in Hong Kong since the early 20th Century, and more successful projects including the cross-harbour tunnels in the 1960s and 1970s (Handley, 1997). Finally, the infrastructure developers from Hong Kong had good

personal relationships with a number of leaders of the governments in East Asian Countries at this time. Therefore, the political risks of BOTs in these countries were reduced, but possibilities of corruption could rise at same time (Handley, 1997). In the period 1986-2001, FDIs in China played an important role in Chinese BOTs and infrastructure development, especially the investments from Hong Kong. Therefore, China's earlier BOT scheme (1986-1994 and 1994-2001) was only open to foreign investors and BOT was seen as a sub-sector of the 'Open Door Policy' rather than as an independent public financial policy or strategy.

This thesis argues that the inception and development of earlier BOTs was part of Chinese decentralisation reform from 1980. Between 1978 and 1992, China decentralised gradually its reforms in rural areas. Later, this reform extended to the public sector, e.g. state-owned enterprises and the local governments, as Naughton (1995, 2007) commented. The reforms in the Chinese economy introduced some new 'concepts', such as 'contracts', 'responsibility', 'profits' and 'markets'. Naughton (2007) analysed that the various of contracts clearly identified not only farmers, managers and local authorities' responsibilities', that also defined their benefits. When farmers, managers and local authorities enforced the state's 'contracts', they were able to retain more production, profit and or revenues for themselves. Prior to 1992 there was significant the decentralisation in the Chinese fiscal system and public administration in SEZs and coastal open cities. The local governments in SEZs and open cities had more 'freedoms' to do what they wanted to do. In this way, BOT was also a result of the Chinese central government's decentralisation programme. Prior to 1994, all BOTs in China were essentially developed and managed by provincial and local governments in SEZs and coastal cities on their own initiatives. The fast-growing local economy, trades and migrants forced the local governments in Guangdong Province to improve the basic infrastructure and facilities. Guangdong provincial government and Shenzhen City Council initially realised they urgently needed better power generation capacity. The governments primarily considered and accepted a proposal from a Hong Kong construction and power facility developer (Hopewell Holdings Ltd.) to develop a plant on a BOT basis in 1984 (Handley, 1997). Located in the Hong Kong border area of China's Guangdong province, the US\$550 million, 700 megawatt

Sha'jiao B project was Asia's first large independent power generation programme (Handley, 1997, Wang and Ke, 2008). A ten-year BOT contract was awarded to the Hopewell Holding company in 1985 and the power plant finished construction and put into operation in 1986. This first BOT scheme encouraged the government in China to study the feasibility of using foreign investment to develop local infrastructure projects, especially for projects which that would directly improve the local economy and investment environments (economic infrastructure). Although the attitude of the Chinese central government on BOT was not explicit at the time, China's BOT models had been utilized on 56 projects by local authorities up to 1994(PPI Group, 2010). 40 of these projects were located in the Special Economic Zones of the Guangdong Province, concentrating on transport and power industries, including: highways, seaports and power stations. The exceptions were one water BOT and two gas pipeline PPPs (with Enron, U.S.A. and BP, the UK (PPI Group, 2010). Moreover, the majority of these BOT projects were sponsored by Hong Kong companies which had good relationships with the officials in the government of Beijing and Guangdong Province (Handley, 1997).

In the period 1986-1994, BOT schemes were implemented as local financing policies in a few coastal provinces. However the programme was controversial, since the Chinese central government was dissatisfied with the fundamentals of the BOT process that totally excluded the central government's administration. Handley (1997) and Wang and Tiong (2000) explained, the central government's ideological objections reflected in part by disagreements over whether the state or private sector should control local infrastructures. Also, the ministries at centre of decision making, e.g. the State Planning Commission (the SPC, later NDRC), Ministry of Foreign Trade and Cooperation (The MFTC, later Ministry of Commerce), Ministry of Electricity and Ministry of Transport believed that they should step into governing the BOT schemes. These ministries believed that through uses of BOT schemes, China's local authorities tended to evade the approval, regulation and supervision of the central government. Furthermore, the central government was not happy that the private contractors gained high profits from the earlier local BOT projects, although it was not clear what the average profit level of these 54 BOT projects was in this period. In the case of the Sha'jiao B BOT project, Hopewell Ltd. had at least a 30% return on their

investments (US\$ 165m in 1990s) (Handley, 1997: 228). Wang and Ke (2008), Blackman and Wu (1998) argued that it was common for provincial governments to accept very high fixed rate on returns for the projects and a very early payback timescale from the sponsors, in return for the latter's commitment to provide rapid development of the new power capacity. The risks associated with the BOT projects were, however, largely retained by the local governments, as previous research has shown (Wang and Ke, 2009). In the Sha'jiao B BOT, a government-owned investment unit became a significant equity partner (a finance guarantor), and another state-owned entity guaranteed power purchase payments and foreign exchange risks. Wang and Ke (2008) and Handley (1997) argued that all major risks of the BOT were retained by the Guangdong provincial government, while offering disproportionate rewards to Hopewell Ltd. The criticism of using BOT also focused on the government's investment decision-making process, as the major pre-1994 BOT projects in China were developed on the basis of Hong Kong's private investors' and their good relationship with government officials and state enterprises in central and Guangdong province. This was instead of many transparent, competitive and standard public biddings (Handley, 1997). Finally, Handley (1997) suggested the primary interest of private investors appeared to be recovery of capital costs as the construction contractor rather than as a public service operator was taking a long-term risk on the income from the projects' operations and maintenance. Indeed, in 1995-1996, Hopewell was reported to be willing to consider the sale of the Sha'jiao B project along with its other power projects in China, suggesting it never intended to be a long-term participant in the Chinese power generation industry (Blackman and Wu, 1998). The earlier lessons from the Chinese local government-dominated BOT projects showed that without clear objectives and regulations, BOT might produce less competitive and more costly service.

2.3.3 The booms and busts of Chinese BOTs: 1994-2001—centralised BOT management, the Fiscal and Taxation Reforms and the Asian Economic Crisis

There is little evidence of the earlier local BOT projects in China (1986-1994) having been examined and regulated by central government. The absence of supervision and regulation by Chinese central government, had raised some major concerns from the centre. The Ministry of Foreign Trade and Cooperation (Now, Ministry of Commerce), the State Planning Commission, the Ministry of Transport and the Ministry of Electricity (Now, the National Electricity Grid Company) had to publish two official Circulars in 1995 urging local authorities to carefully consider the use of BOTs in local infrastructure projects. The major issues of the central government and the ministries concerned were the approval of BOT applications, and the guaranteed high rate of return of BOT projects (at the time, many power generation BOT projects were paid for by the local governmental budgets). The Circular from the State Planning Commissions, Ministry of Transport and Ministry of Electricity (SPC, 1995) suggested that ‘the local authorities should be very careful when using BOT schemes and foreign investments in local infrastructure projects, due to the lack of experience and knowledge available in China at the present. The central government was carrying out some pilot studies on a small number of BOT projects in power station, motorway and water supply industries. The local authorities were advised to consider and study the results and procedures of the pilot BOT projects, and then make their decisions’. Based upon these two Circulars issued in 1995, the State Planning Commission formulized *The BOT Circular 1996: Temporary measures of foreign investment in concession (BOT) project (PSC, 1996)*.

For solve the issue of higher profits levels of local BOT projects, the Chinese central government and its ministries required local authorities to review and re-negotiate the rate of returns in dozens of BOT projects between 1994 and 1995. For new BOT applications, the rates of return on investment were limited to 12% by the State Planning Commission. Blackman and Wu (1998) and Handley (1997) showed that the government tried to cap the higher rate of return of foreign investor sponsored BOT projects, and so stopped approving projects with rates of return in excess of 12%. Handley (1997) commented that the 12% figure is the estimated costs for the state to invest and build its own plants. This looks like a

quasi-Public Sector Comparator evaluation which has been applied in British PFIs. However, a 12% rate of return on BOT made many foreign investors lose interest completely, due to the disproportionate relationship between lower returns and higher risks in the Chinese BOT markets. The restrictions on the BOTs' rate of return were gradually abolished by the governments after 1996 (Handley, 1997). In the period 1994-1996, the central government rapidly centralised the management and approvals of Chinese BOT projects. As a result, a BOT approval system was established at the national level by 1995 and was in consistent use until 2005.

Meanwhile, the central government in China started to implement some pilot BOT projects in power stations, motorway and the water supply industry, trying to offer some standard models or best practices for applying BOTs. The pilot projects were conducted by the central government from 1996. Wang and Ke (2008) reviewed four projects that were selected by the State Planning Committee as BOT pilot projects: Laibin Power Station B BOT, Chengdu No.6 Water Supply Factory BOT, Changsha Power Station BOT (disrupted in 1997), and the Shanghai Dachang Thames Water-Bovis BOT project (the project was purchased-back by the government-owned Shanghai Water Company in 2004). However, Da Yue Consulting Firm (2008) identified two other BOT projects that were also directed by the State Planning Commission in 1990s, the Guangdong Dian-bai motorway BOT and the Wuhan Junshan Bridge BOT projects (disrupted in 1996). All these pilot projects had a series of problems when they were made operational after 2000. The major problems included

- over-estimated market demands and unexpected market changes (Chengdu Water BOT, Shanghai Water BOT, Lai'bin power generation BOT, Changsha power generation BOT),
- the affordability of local governments due to 'expensive' contract (Chengdu Water BOT, Shanghai Water BOT),
- And the political opposition and national security concerns on privately controlled public bridges (Jun'shan Yangtze River Bridge BOT, Wuhan City). 4 out of 6 central government directed BOT pilot projects were finally interrupted or purchased back by the governments. Only the Chengdu water BOT and Dian'bai motorway BOT

projects are still in operation at present.

The central government strongly recommended that local authorities should carefully and prudently use BOT in practices in 1995 and 1996. However, the local governments paid no heed to the central government's suggestions and warnings. On the contrary, they had been more than eager to attract private finance in local infrastructure areas since 1995. The underlying reason for this was the institutional change in the central-local government fiscal relationship after the 1994 tax sharing reform (Naughton, 2007). World Bank (2003), Cheng and Wang (2009), and Wang and Ke (2008) believed that the major reason for the application of BOTs was the change in the central-local government financial relationship since 1994.

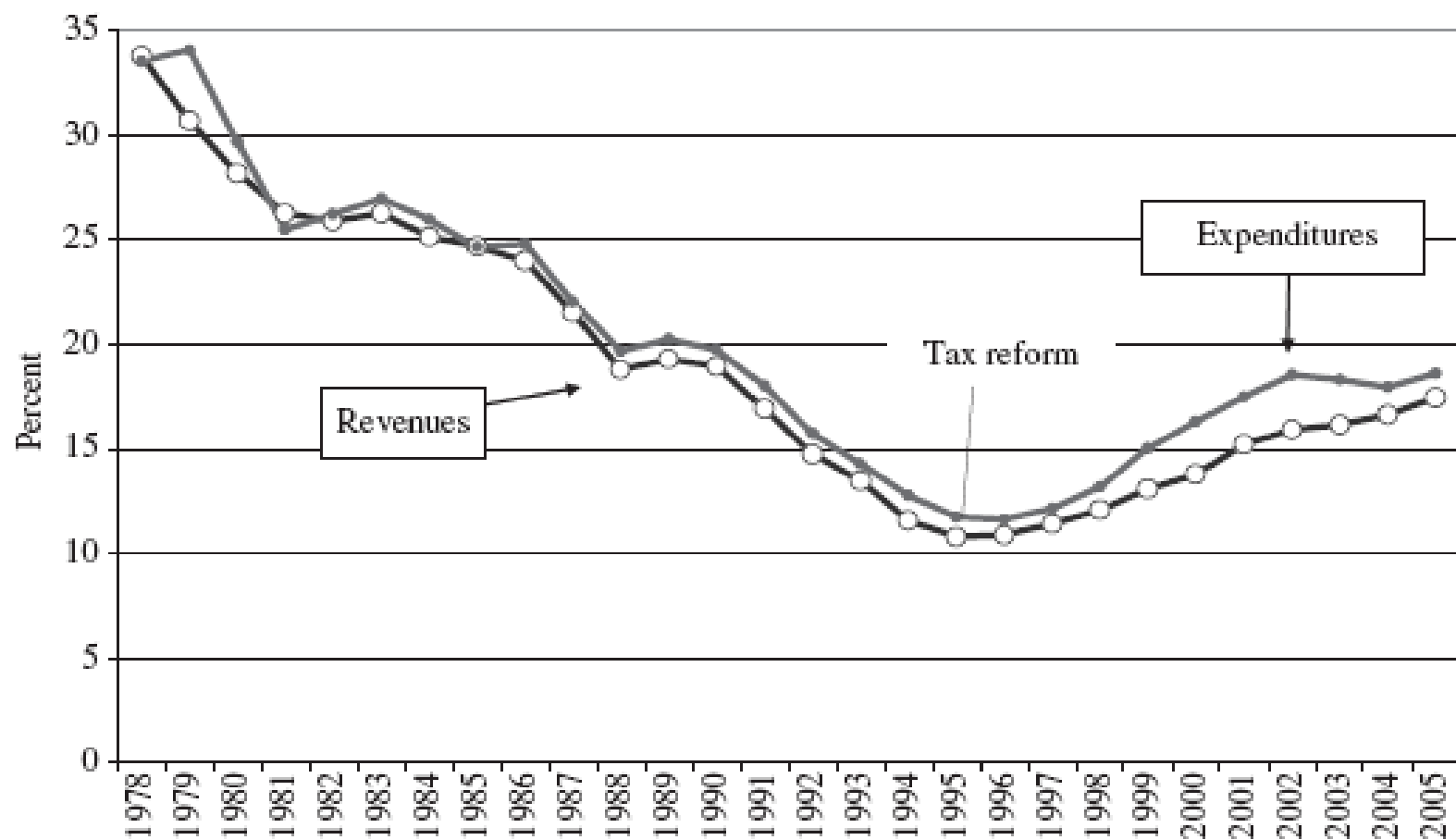
Prior to 1994, China adopted a 'revenue contracting system', in order to encourage local authorities to develop a regional economy and collect revenues (Naughton, 2007). The basis spirit of the Chinese 'revenue contracting system' was that provincial governments remitted a fixed amount of local public revenue to the central government (according to the 'revenue contract'), whilst the rest of the revenue could be retained by the provinces. Under this system, China had no standard for allocating tax income between central and provincial governments, which resulted in the central government negotiating separately with each province (Kuhn, 2010: 90). An example is, Guangdong Province had a 'fiscal revenue contract' was made with the central government in 1980 whereby Guangdong promised to remit RMB 2.274 billion of its tax revenue to central government every year. The rest of Guangdong's fiscal revenues could be managed itself, no matter how much they collected locally (Wang, B, 2008). Beijing, Shanghai and another 28 provinces signed similar contracts with the central government at this time (Su and Zhao, 2010). Under the Chinese Revenue Contracting System, relationships between central and local governments were negotiated on a case-by-case basis, with each provincial government given a revenue target and long-term sharing contracts tailored to that province's economic conditions (Naughton 2007).

During the period 1980-1993, the contracting fiscal system gave provincial governments a certain freedom to decide their own affairs (a kind of fiscal deregulation and decentralisation), encouraging them to develop a regional economy and collect tax

revenue(Su and Zhao, 2004). However, the disadvantage of the Revenue Contracting system was also clear: Central government revenue had been consistently reducing since 1980, due to China's rich provincial governments trying their best to hide their real financial revenues and remit less fiscal revenue to the central government, i.e. keeping more funds at the local level. As a consequence, in the 14 years between 1980 and 1994, total government revenue increased slowly, and central government revenue barely held constant at 1978 levels(Wang, S., 1997:1), see Table 2.7 Chinese government's budgetary Share of GDP (1979-2005) on next page. Finally, central government was in the midst of a great financial crisis! It had almost no money and had no capacity to exercise macroeconomic(Kuhn, 2010). The Ministry of Finance estimated in 1993 that the central government would be bankrupt in 1999 or 2000, if the fiscal revenue and expenditure policies were not changed (Wang, B, 2008). Furthermore, the Revenue Contracting system also widened the fiscal gap between different regions of China (Su and Zhao, 2004). This also led to other political problems for central government with the 17 rich provincial governments and their strong fiscal capabilities (especially, Guangdong) often challenging the authority and decisions of central government (Wang, B., 2008). If the central government had lost control on 'taxation', it would have lost power.

To solve this financial crisis and to improve relationships between central and local governments, the fiscal and taxation reforms were conducted in 1994 under vice-premier Zhu Rongji's leadership (1991-1997, later, the Premier of China, 1998-2003). The new system assigned different categories of taxes to central and local governments, similar to the federalist system used in many Western countries. It included three crucial elements (Cheng & Wang, 2009, Kuhn, 2010, Naughton, 2007, Su & Zhao, 2004): Firstly it introduced taxes to increase central government's revenue (e.g. Value-Added-Tax, VAT, and Corporate Tax). Secondly, it adopted a new tax income assignment and sharing system to clarify the fiscal relationships between central and local governments (the share rate between the centre and local is nearly 50:50). Finally, it established a new central government taxation agency to secure central governments' fiscal revenue without erosion by local governments, see Appendix 1.

Table 2.7 Chinese government's budgetary Share of GDP (1979-2005)



Source: Error! Reference source not found.

The structure of taxation income between the central and local governments was largely changed after 1994. Central government kept over 50% of total tax revenues and allocated less than 50% to local governments. These were then divided up amongst provincial, city, county and township bodies. Moreover, the central government retained the power to set rates and define bases for all taxes, giving the central government pervasive control over all budgetary processes in the country. From 1994, because of the newly introduced tax assignment system, the ratio of provincial provinces' governmental revenue to total fiscal revenue gradually declined from 77.98% in 1993 to 45% in 2002 and to 44.6% in 2010 (Su and Zhao, 2004, China Tax News, 2010).

Although the central government took over control of the country's fiscal revenues, the 1994 fiscal and tax reform in China did not address fiscal expenditure allocation matters between the central and the other four levels of local governments. The allocations of fiscal expenditure remained the same as in the system in place before 1994. China's local governments (at provincial, city, county and township levels) took in less than 50% of all tax revenue, but spent directly about 70% of all expenditures (Naughton, 2007). Finally, the central government also ignored the re-distribution matters between the central, provincial and lower level governments in 1994. Although a tax income re-distribution system was built in 2001, the research of the Ministry of Finance (2004) indicated that the 'inter-government transfer payments system' in China was more beneficial for the rich provinces and the poorest minority ethnic regions (provinces) in order to support the minority area's economic development (like Tibet). In practice, except for the six rich coastal provinces, the rest of the provinces' transfer payments were steadily declining since 1994. In addition, the second level of provincial government in China was claiming as much of the 'inter-government transfer payments' from the centre, as it could, resulting in China's city, county and township governments sharing only a very small portion of inter-government transfer payments (Tong, 2008). The steadily decline of local governments' revenue, resulted into a new financial crisis for local governments, especially at city and county level. The Ministry of Finance investigated that the expenditure of local governments (provincial, city, county and townships) had been steadily increasing to 80% of total national expenditure in 2009 (Ministry of Finance, 2010). Inevitably, the expenditure

responsibilities of local governments have become excessive and unsustainable since the 1994 fiscal and tax reforms. Since 1994 there has also been a steady decline in the proportion of urban infrastructure investment financed from direct budget spending or operating surplus (Ministry of Finance, 2004). The Ministry of Finance (2004) showed that the proportion of total urban infrastructure construction financed by budgetary funds decreased from 50 per cent in 1991 to 29 percent in 2001. Meanwhile BOTs, other marketisation finances, and government's extra-budget finances' (e.g. the charges and tolls on uses of public services and facilities, penalties on road parking, the sale of local publicly owned properties and lands) share in total public infrastructure investments rose from nothing in 1986 to around 30% in 2002.

With weakening fiscal capabilities and increasing demands on local infrastructure projects since 1994, China's local authorities actively introduced foreign investments into local infrastructure projects ignoring central government warnings and suggestions. With shortages of public financing resources, mobilising private investment became popular in many provinces of China, as it was deemed as the 'cheapest' and 'easiest' way to attract capital investment. The local government itself did not need to do anything more than provide some policy guarantees (Cheng & Wang, 2009). This led to the number of BOT projects sharply increasing in 1996 and 1997, 121 BOT projects had reached financial closure and construction had started in these two years (PPI, 2010) During the period 1995-2000, BOT and other forms of PPP projects had been applied in around 225 projects, most of them large-scale power stations, motorways, bridges and airport projects at local levels, undertaken by investors from Hong Kong, Europe and America. Only seven projects were water and sewage treatment BOTs according to the PPI Group's statistics (PPI, 2010). Two of them were pilot projects organised and directed by the State Planning Commission.

However, the development of China's BOT had seriously slowed down by 1998-2000, due to the Asian Financial Crisis in 1997 and 1998. A number of scholars revealed (Fernald & Babson, 1999, Naughton, 2007, Duan, 2009) that China's economy did not suffer from the crisis as much as other Asian countries and regions. However, as the main financial sources of China's BOTs, Hong Kong was largely affected. The willingness to investment in BOTs was damaged during this period, due to the 'chaotic capital and currency' markets in Hong

Kong and other Asian countries (Fenald and Babson, 1999). At the same time the central government of China adopted a 'pro-active' fiscal policy (a Keynesian style policy) to stimulate Chinese economic development during this period 1998-2004(Duan, 2009). About a RMB 900 billion 'Construction Treasury' had been borrowed by the Ministry of Finance during this time. In 2001, over 6000 infrastructure projects had been developed by the government with a total capital value of RMB 1.51 trillion between 1998 and 2001(Xiang, 2001). The direct effect of China's economic stimulation package in 1998 was that a large number of potential BOT applications were finally funded by government's budgetary and debt finances. This led to private finances being 'crowded out' of China's power generation, motorway, seaports, airports and urban water supply industries (Duan, 2009). Therefore, the numbers of signed BOT contracts in 1998, 1999 and 2000 was around 26 projects a year without any significant increase. Many BOT proposals had been withdrawn by central and local authorities. The Changsha City Power Station BOT project which was conducted by the State Planning Commission in 1997 was an example of this. Meanwhile, the central government restricted BOT applications in China between 1998 and 2000, resulting in a large number of local BOT projects that had no the approval from central government being cancelled (Cheng and Wang, 2009).

The second stage of implementation of China's BOTs ended in 2000. The overall effects of the utilisation of BOTs in local places in the period of 1986-2000 were not clear since so few studies have been conducted. Most of the studies focused on China's first BOT project in Shenzhen City and the other four pilot BOT projects organised by the State Planning Commission: e.g.

- Shajiao B plant BOT project (Blackman and Wu, 1998 , Handley, 1997),
- Chengdu city No.6 Water Factory BOT (Qin and Yu, 2004),
- Shanghai Thames-Bovis Water BOT (Fu, *et. al.* , 2006),
- Lai'bin City power station BOT (Wang & Ke, 2008).

However, compared with the total number of BOT projects (282 projects) in this period, only four BOT pilot cases were comprehensively and properly examined by either the government or scholars, leading to few lessons and experiences learnt.

2.3.4 *The Application of BOT in China (2001-2008): Deregulations and marketisation reforms in public infrastructure, and the Financial Crisis since 2008*

In the period between 2001 and 2008, Chinese BOTs entered their golden age (on a par with PFI in the UK). 628 BOT contracts worth \$ US 59.31 billion capital value were signed by the local authorities and approved by the central government's departments, table 2.8 (PPI, 2010).

Table 2.8 Chinese BOT and PPP's development in the period between 2001 and 2009, by capital values

<i>Year</i>	<i>Energy</i>	<i>Telecom</i>	<i>Transport</i>	<i>Water and Sewage</i>	<i>Total values USD\$ million</i>
2000	847	5,653	1,559	72	8,131
2001	997	325	538	242	2,103
2002	1,351	1,430	1,787	918	5,486
2003	4,679	0	4,055	662	9,396
2004	1,390	1,140	783	603	3,916
2005	1,706	0	6,629	1,007	9,342
2006	1,198	0	8,351	604	10,153
2007	2,199	0	4,494	1,902	8,595
2008	679	0	437	974	2,089
2009	3,095	0	2,513	512	6,120

Source: PPI Group, the World Bank 2010

As presented in Table 2.09, BOT and PPP models involve the major Chinese public infrastructures areas, including: energy, transportation, telecom, water and waste management, according to the PPI's statistics in 2010. As a result, private investment accounted for almost 20% of the infrastructure funds in China, as the PPI Group of the World Bank estimated in 2009 (PPI, 2010). The Chinese transport industry, which includes BOT projects for roads, bridges, ports, undergrounds and tunnels, has absorbed nearly half of all total private investments in the last two decades, in terms of capital value. However, the water and sewage treatment sectors have the largest number of BOTs to date. However, as this study reveals the data of the PPI group of the World Bank is contradictory to the data collected in later primary research. According to an internal review report by China's Ministry of Construction in 2009, China has built and operated over 1792 sewage treatment plants so far, and other 1977 sewage treatment facilities are under construction. At least half the number of these projects were built by the private sectors in forms of BOT, TOT, BT (Build-Transfer) and Joint-venture models. That means at least 1875 sewage treatment

projects have adopted PPPs by mid 2009 in China.

Table 2.9 PPPs in China: Industries and Numbers

<i>Financial Closure Year</i>	<i>Energy</i>	<i>Telecom</i>	<i>Transport</i>	<i>Water and Sewage</i>	<i>Total</i>
<i>1990</i>	0	0	1	0	1
<i>1991</i>	0	0	2	0	2
<i>1992</i>	2	0	4	0	6
<i>1993</i>	10	0	7	0	17
<i>1994</i>	11	0	18	2	31
<i>1995</i>	8	0	6	1	15
<i>1996</i>	18	0	29	4	51
<i>1997</i>	30	1	33	6	70
<i>1998</i>	8	0	19	10	37
<i>1999</i>	12	0	11	3	26
<i>2000</i>	11	1	8	6	26
<i>2001</i>	30	1	4	10	45
<i>2002</i>	49	1	9	18	77
<i>2003</i>	47	0	9	25	81
<i>2004</i>	26	0	10	28	64
<i>2005</i>	31	0	16	42	89
<i>2006</i>	22	0	18	43	83
<i>2007</i>	31	0	12	60	103
<i>2008</i>	10	0	5	46	61
<i>2009</i>	12	0	3	31	46
<i>Total</i>	368	4	224	335	931

Source: Database Private Participation Infrastructure Department, World Bank, 2010

In the transport BOT and PPP markets, Hong Kong investors accounted for over 90% of the share in terms of capital value and number of projects (the PPI, 2010). Four investors dominated the markets of motorways, tunnels, bridges, underground and seaports, they were: New World Development Co. Ltd., Hopewell Holdings, Hong Kong MTR (underground), and Hutchison Whampoa Ltd. (and its subsidiary company, Cheung Kong Infrastructure Holdings Ltd). In the Chinese water and sewage BOT markets, there is no such concentration and monopolization as there is in the transport market. A number of private players from Europe, mainland China, Hong Kong, Singapore and the United States were involved in different projects. However French Companies have a larger share of the market than others; they include SUEZ, Veolia Environment (PPI, 2010). In the Gas and Electricity PPP and BOT market, the Cheung Kong Infrastructure Holdings Ltd (Hong Kong), contractors from Europe and the United States, Xin'ao Gas (China), China Gas Ltd. (a Chinese government-controlled Hong Kong Plc), and Wah Sang Gas Holdings Limited (Hong Kong) have the majority shares of the market.

Assuming the PPI Group's data is correct, it showed that international and Hong Kong investors have the largest share of the Chinese BOT and PPP market at present. The data (PPI, 2010) also shows that Chinese domestic investors have been playing a more important role since 2001, owing to their growing share and increasing number of projects in the sewage treatment and gas supply BOT markets. However, one study conducted by Braadbaart, Zhang and Wang (2009) found that many of the sewage treatment BOT contracts (in 37 projects) they examined qualify as public-public-partnerships rather than 'public-private-partnerships', due to the fact that the BOT contractors are actually commercialized SOEs (public-owned public listed companies).

The increase in BOTs from 2001 is due to the central government, especially the National Development and Reform Commission (NDRC) re-launching the programmes, in order to encourage Chinese domestic investors into public infrastructure fields. The key industries of BOT were still power generation and transportation. However, from 2002 onwards the attentions of the government has gradually been transferred to the publicly owned utility industries, especially the water supply, sewage treatment, gas supply, heating supply and

solid waste treatment sectors (MOC, 2002). Under the central government and its ministries, local authorities in China actively and continually expanded the scope and scale of the uses of BOTs and other private financing infrastructure programmes locally (Ho, 2006). The main objectives of the use of BOT has changed since 2001. BOTs and PPPs were used not only to ‘introduce private investments’ for developing China’s underinvested infrastructures, but also aimed at ‘reforming the public investment system and improving the efficiency of public infrastructure construction and operation’ (NDRC, 2004).

The changes in China’s opinions on using the domestic private economy indicated that the government had started to deregulate private investments in public-owned infrastructure and service’ industries. As the State Planning Commission (2001, para 1) stated that

‘due to a number of restrictions, Chinese domestic private economy has developed slowly over the last decade... to promote the development of the private economy in China, the central government decided to offer some suggestions: that the public authorities and agencies should fully understand the individual, private and other non-public economies are an important part of the Chinese socialist market economy. The governments should assist private and non-government investments and create a fair and good environment for the private economy’s development... the Chinese domestic private sector should be permitted and encouraged to invest in sectors where foreign investors had rights to invest in, especially for the urban public infrastructure industries, such as, water supply, sewage treatment, road, bridge etc.’

Meanwhile, in 2002, the government officially kicked off the marketisation reform of public utilities by promulgating the *Opinions on Accelerating the Marketisation of Public Utilities* (MOC, 2002). This circular emphasized the importance of the market and was expected to bring in vital investment and increased efficiency through the involvement of the private sector. Furthermore, the State Council and the National Development and Reform Commission (2004, 2006) decided to reform the existing approval system on public investments. The central government declared that the non-government investments (e.g. BOT and PPP funded by Chinese domestic investors) did not need approval from the National Development and Reform Commission, except where projects involved national security and where current legislation had clearly prevented private participation. As a

consequence of this, the approval and management of BOTs were essentially decentralised to the provincial governments.

By reviewing the key policies that had been issued by the central government of China in 2001, 2002, 2004, 2005 and 2010, one can see that the strategies of the Chinese reforms on public infrastructures were ‘pro-market’, ‘pro-competition’ and ‘efficiency-emphasised’, which underpinned the ideas of the New Institutional Economics and the practice of NPM reforms in western countries. Firstly, the central government was trying to create competition in the provision of public infrastructure and social services by introducing ‘new private entrants’ into the markets and at the same time diversifying the investment sources with different ownership’ investors. ‘This (marketisation of Chinese public services) usually involves encouraging multiple suppliers to establish themselves alongside state agencies as an alternative source...’ (Wong and Flynn, 2001:9). Moreover, the government claimed that the state monopoly on these industries should be broken, as the State Council and the NRDC stated in a series of official documents in 2004, 2005 and 2010. The State Council (2004) declared that the public investment system should be reformed. Public resources and investments should be allocated more efficiently according to ‘market’ mechanisms rather than administrative orders. Through embracing ‘marketisation’ approaches and creating more competition between the state-owned and the private providers of public infrastructure and services, the government anticipated that ‘efficiency’ improvements could finally be achieved in these fields.

The rise of BOTs in China was also driven by the abnormal urbanisation and the worsening environment from 2001. China is the largest countries in the world measured by populations, and third largest by the national land area. The total Chinese population is about 1,300 million. The total number of Chinese cities is was 333 in 2009. Major cities in China include Shanghai (10 million inhabitants), Beijing (7.9 million), Tianjin (5.1 million), Guangzhou (4.7 million), Wuhan (4.6 million) and Chongqing (4.2 million). There are at least 49 cities’ with a population over 1 million. Following the economic development and urbanization in recent decades, the total urban population of China reached to 683 million in 2009 (46% of the total population) from 170 million in 1978 (17%). Also, tens of millions people who lived in the countryside moved to the cities every year (the basic data

and profile of China presented in Appendix 2). The massive urbanization of China put serious demands on public infrastructures and affected social issues in, for example, employment, education, health and social security. However, the current standard of public facilities and services is relatively low, compared with OECD countries, as shown in table 2-10. Thus, substantial improvement is required to meet practical needs.

Table 2-10 Comparative Infrastructure Indicators of China

Indicators	China	East Asia and Pacific Average	Lower middle income Countries	OECD Average
<i>GNI per capita, Atlas method (current US\$)</i>	2,010	2,111	2,042	33,470
<i>Access to electricity (% of population)</i>	99	63	67	..
<i>Electric power consumption (kwh per capita)</i>	987	1,230	929	8,769
<i>Improved water source (% of population with access)</i>	77	75	83	99
<i>Improved sanitation facilities (% of population with access)</i>	44	60	68	..
<i>Total telephone subscribers per 100 inhabitants</i>	57	28	37	

Source: PPI, World Bank, (2009)

At same time, the urbanisations and economic development in China caused serious environmental problems (Naughton, 2007). For sewage treatment industries, existing facilities for treating urban domestic wastewater were seriously deficient and the construction of new ones lagged behind. By the end of 2001, the rate of primary treatment of urban domestic wastewater was merely 36.4% of the total amount produced, of which only 18% received secondary treatment, as Chang (2008) investigated. China will need hundreds of billions of RMB to construct treatment facilities for urban wastewater. Adams, et. al, (2006), Fu, et. al, (2006) predicted, under the current investment mechanisms and capabilities, it will be very difficult to meet these demands, for some local areas, and the problem of insufficient funding for the construction of urban environmental infrastructure will be very serious. Studies done by the World Bank (2008) revealed water pollution

represents a growing constraint on national development objectives in China. The growing awareness on Chinese environments problems has forced both central and local governments in China to make larger investments in sewage treatment and solid waste treatment industries, as the Ministry of Construction declared in 2002 and 2004. As a consequence, Chinese BOTs have rapidly increased since 2003, and reached a peak in 2005, 2006 and 2007(PPI, 2010).

Finally, in November 2008, due to the Financial Crisis, the Chinese government declared a huge ‘public infrastructure and economic stimulation plan’ worth 4 trillion RMB in 2009 and 2010 (£400 billion in 2008). This package has been spent in 10 major areas, such as low-income housing, rural infrastructure, water, electricity, transportation (2 trillion RMB on the Chinese High-speed Railway Network Infrastructure), the environment, and technological innovation and rebuilding from several disasters. The effects of China’s stimulation plan in 2008 on the Chinese BOT programme were clear in 2009, Signed contract numbers fell to 46 projects and 17 in 2010, having been 106 in 2007. However, the strategies of the government on encouraging private participation in infrastructure has not changed.

Although the BOT and other ‘marketisation’ methods have been widely utilised in China’s infrastructure industries, one aspect has not been sufficiently addressed by both central and local governments and that is the measurement of the performance of these privately financed projects. A performance measurement system of BOTs had still not been established by the government by 2010. It is not clear which departments or ministries at central and local government levels are responsible for the inspections of the BOT project’s performances and little information has been released by central or local governments so far. There have only been a few attempts to examine BOT project’ performance, such as, the Ministry of Construction (2005) requiring local authorities to evaluate the performances of BOT projects and private contractors every two years. These review reports on BOTs and their private contractors should be disclosed to the public. However, detailed guidance on how to conduct such evaluations had not been issued by the Ministry of Construction. Due to inadequate BOT evaluations over the last few decades, some basic data and information on BOT implementations is not clear, such as, the numbers of BOT projects that have been

adopted, the performance indicators of China's BOTs, the efficiency and the effectiveness of BOT in practice, and lessons from the previous uses of BOTs.

2.4 Debates and arguments concerning the implementation of China's BOT

Much of the debates of China's BOTs have been raised in the previous studies. These include:

- The overall effect of the implementation of BOT in different industries (efficiency and effectiveness) (Qin and Yu, 2005, Jong, 2008, Li, 2009, Fu et. al. 2006).
- Competition in BOT procuring, tendering and post-contract stages, the risk transfer and allocation (Fu et. al., 2006, Wang, 2000, 2009),
- the absence of BOT's legal, institutional and regulatory frameworks (Adam, et. al., 2005, Jiang, 2009; Ho, 2006).
- The weakness capabilities and lack of experience of the public sectors (Fu and Zhong, 2007, Wang and Ke, 2008, Ho, 2006)
- Poor contract practice and management (Fu and Zhong, 2007)
- The low transparency of relevant information about BOTs.

In this part, by reviewing over fifty studies that have been published in Chinese and English, the debates and the arguments about China's BOT programmes can be summarised here.

2.4.1 The overall effect of the implementation of BOTs in China

Due to lack of detailed data, only a few of studies have assessed and measured the performance of BOT projects at present. The findings of previous studies on the overall effects of the implementation of BOTs are mixed. These covered China's road, transportation, water and power generation fields.

Most of the BOT proponents emphasised the 'effectiveness' of BOT policy and its primary objective; i.e. the introduction of private investment capital in infrastructure. From this view of point, BOT is an effective programme which realised the government's basic claim aimed at injecting private capital into the infrastructure and public services. Jong (2008) thought the overall experience of China's highway BOTs has been positive. This study was based on seven motorway case studies and the interviews with the decision-makers in the provincial governments. Jong's (2008) findings indicated that the decision-making processes of the BOTs were speeded up and the costs in the application and approval

process were reduced. More important, Jong showed that professional and skilled BOT contractors were selected and appointed by the public procuring authorities through ‘competitive bidding’, thereby improving the management and efficiency within public transportation. Although some problems have been observed in BOT practice, e.g. the absence of BOT legislation, the lack of standard assessments on environmental matters and some problems with risk allocation, the overall effectiveness of the transportation (motorway) BOT programme is positive (Jong, 2009). Qin and Yu (2005) also examined the results of the Chinese utilities BOTs. The findings of Qin and Yu commented that BOT is an innovative approach to developing public utilities in China under the present Chinese public financing system. Great benefits have been achieved by the implementation of BOTs, in terms of the number of projects and the project capital values channelled into the public utilities sector. Qin and Yu (2005) believed that the uses of BOT in China’s water, sewage treatment, solid waste treatment and heating supply have improved overall efficiency of utility services, even though the BOT legislation and regulatory frameworks still need to be improved.

Zhang (2007) also expressed a similar point of view with Qin and Yu (2005). Based upon his studies on seven water BOT, TOT, joint venture and privatisation projects, Zhang (2009) found that the marketisation reform on the Chinese water sector has been ‘successful’ and effective. He believed that the most important points are the large amount of private capital injected into the water sector, the strategic investors and private contractors that have been introduced, and the significant improvement in the management of water facilities.

However, not all scholars agreed with the points of view mentioned. Most debates emphasised the efficiency of BOTs’ as a public financing scheme, as well as being individual projects. The arguments mainly concentrated on the water and the transportation BOTs. For instance, Fu and Zhong (2006) challenged the view points that the BOT model is suitable for developing Chinese water facilities. Using evidence collected from over 40 water BOT projects and the 12 water BOT cases studies, Zhong and Fu (2006) believed that the overall result of the implementation of BOT in the water sector is negative. Firstly, the local governments always got the big contracts, due to the public sector managers’ poor knowledge and skills in the BOT planning, contracting and negotiating stages. Secondly,

the governments and the contractors often overestimated market demands, leading to high operating costs and some losses for the BOT contractors. In many water BOTs, the governments still have to make a subsidy to the contractors and provide a guarantee on the return of private investments. In those cases, a number of commercial risks have not been transferred to the private sector (e.g. demand risks, exchange risks and inflation risks), thereby, the governments often made the 'bad' deals. Finally, the evaluation on the performance of BOT contractors were not properly conducted by local governments which led to the output and performance of the BOT project being unknown. As Zhong et. al. (2006) argued the overall efficiency of BOTs in the water sector is low, since the substantial risks have not been transferred, the transaction costs are higher and there were poor post-contract evaluations. BOT did introduce private capital investment to the water sector, but contracts could be very expensive.

In addition, Li (2009) has studied eight Chinese transportation BOTs and PPP pilot projects in four cities (bus and underground projects). He concluded that market-oriented reforms were completely inefficient and ineffective. His findings showed that the marketisation reforms, included BOT and PPP projects in the underground and bus sectors failed to solve traffic problems in the cities. Also, there is no significant improvement in public transportation service quality. Some bus PPP contractors keep making losses. In the meantime, some serious accidents and technical problems frequently occurred in the constructing, contracting and operating of underground BOT projects, though penalties on contractors are seldom made. Li (2009) argued that the welfare aspects of public transport services are being challenged by profit-seeking private capital. At the end of his study, Li (2009) found that in some BOT and PPP cases, the government has already 'stepped in' and the private contractors 'stepped out'. Moreover, Li recommends the governments should consider the alternatives to BOT and PPP.

Meanwhile, some research into BOT offered contrasting conclusions on the effect of the use of BOTs in China's infrastructure projects. The International Finance Corporation (IFC) of the World Bank (2004) commented that BOTs brought both benefits and costs to China. In terms of the experience of Chinese road, water and power generation BOTs, the IFC's report revealed BOTs and PPPs are good alternatives for Chinese publicly-funded projects.

However, the main barriers of implementation of Chinese BOTs are the contextual constraints, e.g. the lack of a BOT legal framework and the underdeveloped Chinese banking, financial and capital markets. Wang and Ke (2009) stated that the BOT model is not suitable for all infrastructure projects and it depends on the characteristics of the infrastructure fields, the risks of BOT projects differed from case to case. Wang and Ke (2009) suggest that the key success factors of BOTs in China are overall managerial capabilities and competence of the governments, the skills and experience of the contractors, the profitability of the individual project and the risk control management.

2.4.2 The competition, efficiency and the implementation of BOT

As one rationale to use BOT, the central government of China claimed the application of BOT schemes could create competition among suppliers of public services, and ultimately achieve greater efficiency within the public sectors (State Council, 2004, 2005, 2006, Ministry of Construction, 2002, 2005). However, as Fu and Zhong (2007) argued that the central government did not offer detailed guidance the creation of real competition in BOT practice, except for the compulsory competitive bidding identified in the 1996 *BOT Circular* from the State Planning Commission (1996). Fu, Chang and Zhong (2006) and Wang and Ke (2008) agreed that strong competition was found in seven large water and power generation BOT pilot projects which were organised by central government in the 1990s and another five large water BOTs at local level after 2000s. However, the competition in medium and small size water BOT projects is unclear. Zhang (2009) mentioned that in these water projects, non-competitive bidding was also allowed by the public procuring bodies. As Zhang (2009) pointed out the degree of competition in the non-competitive BOT procuring and tendering process is weaker than the 'competitive bidding'. Zhang went on to say that it is not clear that how many water projects adopted the 'non-competitive bidding' approach in China.

Fu et. al. (2006) also noted that in the post-contracting stage, the degree of competition was not sufficient. This was due to the fact that most of the infrastructure projects (e.g. water and motorway) were providing public goods and services and were usually a monopoly. In such cases it is difficult to create competition throughout the lifetime of the BOT's contract

(Fu, *et. al*,2006).

Since all Chinese BOT projects were implemented at local levels by provincial or city public authorities, there are few studies that have assessed the degree of competition for BOT programmes at provincial and city level. However, the evidence from some studies (Ho 2006, Adams *et. al.*, 2006) reveals that Chinese local authorities may not always have emphasised competition and efficiency improvement. Ho (2006), Adams *et. al.* (2006) and Qin and Yu (2005) explored the provincial and city governments' emphasis was on attracting BOT investment from the private sector, whilst paying little attention to creating market competition and achieving greater efficiency improvements. These researchers argued that Chinese central and local governments should increase their focus on creating 'competition' and improving efficiency in the public infrastructure and service' fields. Adam, *et. al.*, (2005), Zhong *et al*, (2006) and Chen & Messor (2003) expressed similar opinions, while contesting that the efficiency promotion in Chinese BOTs cannot be easily achieved in practice so long as the government does not translate these objectives into detailed executive policies, regulations and procedures, in the absence of the Chinese BOT regulatory framework.

Finally, the degree of the competition may also depend on how the contract is designed. In Chinese BOT practice, 'non-competitive clauses' in BOT contracts were found in many cases. These clauses may secure a private monopoly share in the local infrastructure market, as Fu, *et. al*, (2006) argued. As reviewed in China's official *BOT Circular* in 1996 (SPC, 1996) and the four *Standardised BOT Contracts (Water supply, sewage treatment, waste treatment and gas supply)* issued by the Ministry of Construction in 2004 and 2006 (MOC, 2004a, 2004b, 2006a, 2006b), it can be found all these documents promised private BOT operators a non-competitive position in local markets. Such 'clauses' in BOT contracts were known as 'non-competition clauses (guarantees)'. The clauses defined that local authorities should not build similar infrastructure projects locally, if a BOT project had already been set up. The intention behind the 'non-competitive clauses of BOT contracts may be that the private contractors need a kind of guarantee from the governments to secure their return on investment. On the other hand, the government wanted to attract private investors through this arrangement and prevent overlapping investments in public

infrastructure projects (Wang and Ke, 2009). However, the real effect of these clauses is clear, as Fu and Zhong (2007) explained. The BOT private operators aimed to achieve a monopoly positions in local markets as soon as they closed the deal, and these non-competitive guarantees secure that the private investors and operators could cover their returns on investments within the lifetime of the BOT contract. When the competition became very weak at *ex post* contract stages, the government's regulation and supervisions on the performance became very important to ensure that efficient and effective services would be produced by the contractors. However, such evaluating system and method on BOT have been established yet (Qin and Yu, 2005 and Fu. *et. al.*, 2006). Other potential problems surrounding non-competitive clauses in the BOT contract have not been fully discussed in previous studies, e.g. 'lock-in' problem, the risk transfer and allocation, and interactions with other infrastructure projects.

2.4.3 The debates on the BOT contract and management

Ho (2006) argued that the local authorities in China do not always concentrate on the design, formulation and negotiation of good BOT contracts. In his view, Ho (2006) believed that the local procuring bodies largely underestimated the importance of the contract. Fu and Zhong (2007) did note the importance of the BOT contract in practice. They believed that in general, the service regulation of BOT projects or other relies mainly on the BOT contract. In this sense, the items and conditions defined in a contract are critical for regulating the performance of the private operators. Of course, as the important measure to manage the risks associated with BOT, the BOT contracts and agreements aim at identify and allocate the potential risks and benefits in the future (e.g. Wang and Ke, 2009, Qin and Yu, 2005, Zhang, 2009).

However, the empirical evidence of the Chinese water sector marketisation reforms that had private sector participation shows there were organised no contracts. According to the 'MOC survey of 2005, less than 50% of the (BOT and PPP) projects signed the concession agreement and the relevant contracts [between the procuring authorities and the contractors]. As it was, over 50% of the reformed [marketised] wastewater projects were without agreements or contracts which might cause hidden problems for future

management and regulation. However, this is inconclusive at this moment' (Fu & Zhong, 2007: 6). It is really difficult to imagine why and how BOT projects were conducted without the contracts between public authorities and private contractors, Fu and Zhong (2007) provided no detailed explanation for the absence of BOT contracts in these water projects. By reviewing all the private financing models in the world, there is wide agreement that the contract is the foundation of a privately financed project.

Considering the problems linked with BOT contract issues, the MOC has made some good progress to improve things. Four standardized BOT contract models have been designed, drafted and issued by the MOC in 2004 and 2006 (MOC, 2004a, 2004b, 2004c, 2006a). These included

- the Urban Waste Disposal (Rubbish) Treatment BOT contract model (23 pages),
- the Gas Supply BOT contract model (17 pages),
- the Urban Water Supply BOT contract model (37 pages)
- the Urban Sewage Treatment BOT contract model (50 pages).

The MOC's BOT contract models offer a general framework and guidance on designing and drafting the BOT contracts for local authorities. However, there is no literature available in the uses of these contracts so far and the subject needs further study.

Meanwhile, there are still no standard contract models for motorway and power generation projects. Few of the existing literature addresses the contracting problems of BOT projects in China, although the piecemeal information about the BOT contracts and their management has been found in a few studies. The possible reason may be low transparency and poor accessibility of BOT information. Current studies seldom address the contracting practice in the BOT projects, except for the studies on the risk management. A number of contracting problems have not been covered by the previous studies, such as, the transaction costs, the relationship of both sides of the BOT contract etc.

2.4.4 The risk transfer and allocation in the BOT arrangement

Wang (1999, 2000), Wang and Ke (2009) debated that official documents had rarely addressed the 'risks' involved in BOT projects. At the same time, risks transfer and allocation between public client and BOT contractors had not been set out as one of the

objectives in China's BOT policies. In a few the government's documents and policies analysis of risk was looked at in very simple terms. One example of this was, in 1996, the BOT Circular issued by the State Planning Commission (1996) had stated that the political risks (policy change risk) and commercial risks associated with BOT projects should be shared between public clients and private contractors. However, the State Planning Commission did not interpret which risks should be allocated to which parties of the BOT contract.

At the same time, the four *Standard Models of BOT Contract* (MOC, 2004) also did not identify all the risks related to BOT projects. They did mention two common risks associated with the utilities BOT projects, i.e. the risks of policy and law changes and the force majeure risks. However, the Ministry of Construction did not give any guidance as to how to allocate these two risks between the public procuring authorities and private contractors. The application of a BOT cannot proceed without considering the risk allocation between local authorities and private contractors. In practice, the academics and practitioners have noted that risk management of China's BOTs is crucial for the success of the projects (Wang, et. al., 1999, Wang, et. al., 2000, Zeng, et. al., 2008, Chen, Xuan and An, 2010). For the governments, the risks associated with BOTs may bring more costs and financial burdens and ultimately have a profound impact on the public services delivered by the BOT. For the private contractors various risks would have large major influences on the project's profitability and on the extra costs of raising capital (Zeng et.al., 2008). As Handley (1997) and Wang and Ke (2009) explored the BOT model has brought greater opportunities for both the project contractor and the government who are going to develop the infrastructure project. At the same time it has also brought bigger risks to both parties within the contracts.

The early study (Wang, et. al., 1999, 2000) of China's BOT risks focused on the political risks and foreign exchange risks related to the projects from the private contractors' point of view. This was because all the earlier BOTs (prior to 2001) were funded by FDIs, and foreign investors who were unfamiliar with Chinese BOT regulations, approval processes and legal frameworks. The foreign exchange risks of BOTs were high in those days because the investments on BOTs were mainly by foreign currencies, usually U.S dollar. Therefore

the risks of foreign exchange rates' changes and the risks of converting Chinese RMB to foreign currencies was more significant to private contractors (Qin and Yu, 2005). Furthermore, Wang (2000) showed that private contractors in China's Power Station BOTs may have paid more attention to the risks that had real effects on the their return of investment, such as the risks of the government guarantee on purchasing contracts, the tariff adjustment risks and dispatch constraint (of their services) risks.

Following the BOT models' expansion in China from 2000, studies on the risks associated with water and power generation BOT projects paid more attention to identifying what kind of risks have most often been involved in BOT models in China (from the perspectives of the private contractors). As Wang (2000) and Zeng *et. al.* (2008) identified the six main sorts of risk related to China's BOT projects, broadly classified as: political risks, construction risks, operating risks, market and revenue risks and finally legal risks. Greater detail showed that there might be over 30 different kinds of risk associated with China's BOT projects. However, as Zeng *et. al.* (2008) showed there are several risks that were more critical to the private contractors involved in water project:

- the risk from a change in tax policy, the risks from fluctuation of loan interest rates,
- the risk from variation of the water resources price,
- the risk from the fluctuation of foreign exchange rates,
- the risk from government promise and guarantees.

By reviewing the journal articles on Chinese BOT over the last ten years, nearly 30 of the 45 studies focused on the risks related to BOT. However, these past reports usually concentrated on the identification of the risks related to the projects from the private contractors' perceptions. The risk of BOT for the public procurement authorities was not sufficiently addressed. Very little information was available in studies by Handley (1997, Blackman and Wu, 1998). They found that the majority of demand and exchange rate change risks for the Sha'jiao B power station BOT were actually undertaken by the public authorities rather than the private sponsors. Fu and Zhong (2007) explored that the overestimated demands for water service lead to Chengdu city council purchasing the oversupplied service from the BOT contractor. It is not clear to what extent these risks had been allocated between the public and private sectors under the BOT schemes. However,

the danger is that the government seems not to have been aware of possible risks that have been brought on by the BOT models. This is because few studies and evaluations have been done by the governments and by academics. In terms of the sectors and industries, most previous studies concentrate on the water and power generation BOTs. Few studies explore the risks transfer and allocation in Chinese BOT projects.

2.4.5 Under-developed Chinese BOT legal, regulatory and governance framework

BOT is a sub-sector reform of the Chinese marketisation of infrastructure and public services, and the implementation of a BOT is constrained by these environmental factors too. A number of scholars and organisations argued (ADB, 2003, Adams, *et. al.* 2006, Zhong, 2008, Fu, *et. al.*, 2006) that in contrast to the growing number of BOT projects in China, the BOT regulatory and legal frameworks had developed slowly in the last two decades.

The report of the IFC (World Bank, 2003) and Jiang (2009) presented the BOT legislation frameworks by analysing the laws associated with BOT. These may include

- China's Constitution (1982, 1983, 1999, 2004),
- The Budget Law (1994),
- The Guarantee Law (1995),
- the Tendering and Bidding Law (1999)
- The General Principles of the Civil Law (1986),
- The Contract Law (2000),
- Administration of Land Law (1999).
- The Investment Catalogue issued by the NRDC (2004, 2010)
- Company laws (1994),
- The Security Law (1995),
- The Bidding Law (1999)
- The BOT Circular (1996)
- The specific-sector laws, e.g. The Road Law (1997, 1999, 2004), The Water Law (1988, 2002)

To date, China has not implemented any special legislation needed for BOTs, although the

central government attempted to publish a BOT law in 1996. At the time, the draft BOT law was submitted to the National People's Congress. However, the ideological and technical debates on this draft in the congress forced the government to withdraw it immediately. The BOT Law draft was finally issued by the State Planning Committee as the *BOT Circular* in 1996.

In addition, 15 governmental policies and circulars created in the 1990s are the rudiments of China's BOT laws. To some extent, these Circulars still act as a legal guide in the operation of China's BOT projects, although there has been big changes in Chinese BOT practice, e.g. the domestic investors allowed into BOT market in 2001 and the decentralisation of BOT approval to provincial governments in 2005 (China International Engineering Consulting Corporation, CIECC, 2004).

However, the existing policies to regulate BOTs are not perfect (Jiang, 2009), and have conflict with other Chinese laws, e.g. China's Constitution, The Budget Law, The Guarantee Law, the Bidding Law etc. For instance, in BOT contracts, the public authorities usually need to offer a number of guarantees, e.g. operation period guarantees, project service guarantees non-competition guarantees, foreign exchange and outward guarantees, etc. to private contractors. These guarantees are in direct conflict with China's Guarantee Law, since Article 8 of the Guarantee Law stipulates that, 'state organs (governments and its agencies) shall not be guarantors'. As the World Bank, IFC (2003:9) argued that China's approach to BOT legislation was piecemeal and lack clarity with the regulatory framework confusing investors on answers to the basic question: 'which laws are applicable, and what are the legal effects of the various notices, circulars, and approvals?' For the BOT contracts, there is a lot of uncertainty with legislation and regulatory framework.

Another matter is that a clear BOT governance framework has not been setup to formulate and design Chinese BOT policies at central and local levels (Ho, 2006). During the period of 1995 and 2005, the State Planning Commission (later, State Development and Reform Commission) appeared to dominate China's BOT policies' design and formulation process with assistance from other ministries in central government, Ministry of Electricity, Ministry of Transport, Ministry of Construction and Ministry of Foreign Trade and Cooperation. The governance framework of BOTs was extremely complex, but incomplete

and ineffective. A BOT application had to be approved by 16 different agencies at central government level and by the same numbers of agencies at local government level (IFC, 2003, Chen and Messor, 2003). The original purpose of this complex regulatory framework was that the central government wanted to ensure that local governments had the well-defined plans and well-drafted contracts. Also the central government hoped to cap the high rate of return to private contractors and ensure that substantial risks would be 'shared' with the private sector, e.g. foreign exchange risks and demand risks (Handly, 1999, World Bank, 2003). However, in practice, the approval and regulatory procedures were too complex, very time-consuming and had high costs (World Bank, 2003).

From 2005, the BOT management was devolved from the NRDC at central level to provincial governments, leaving no central ministry responsible for the policy's design, formulation and application approval. This particularly affected the motorway, power and energy and other infrastructure projects. Only the Ministry of Construction took over some responsibilities of formulating BOT policy and guidance in the utilities sectors. However, Fu and Zhong (2007) found that water BOT schemes actually involved a number of public sector reforms and sub-reform. In the case of the water industry, implementation of BOT involved new ways of land use, the public assets-management matters of public water companies, the public financing and investment mechanism reforms in public sectors, the public accounting system and taxation's adjustments, water tariff's adjustments etc. However, the existing authority of the Ministry of Construction was insufficient and incapable of making these reforms. The reason for the decentralisation of BOT management from the centre to provinces was that the government want to simplify the approval procedures and speed up the decision-making process (Jong, 2009). However, what were the effects of this decentralisation? Do the provincial and city governments have sufficient capabilities, skills and resources to regulate BOTs? The former question has no an answer as yet. However, some scholars have addressed the later question.

2.4.6 The Lack of expertise, experience and skills of BOTs in the public sector

The previous studies (IFC, 2004, ADB, 2003, Fu, et. al, 2006, Zhong, 2008, Zhang, 2008) argued that BOT programmes are a relatively new experience to government officials, and

that there is an apparent lack of experience on the commercial, technical, and legal aspects of BOTs in China. Qin and Yu (2005), Adam et. al. (2003) and Ho (2006) pointed out neither the central nor local government have sufficient experts, knowledge, experience and skills to apply BOTs. As Wang and Ke (2009) commented to properly implement BOTs, the governments at central and local levels need the financial, legal and technical professionals to do this work. The public authorities need the inter-disciplinary talents of people who not only understand the public sector and project management, but also have in-depth knowledge of finance, legislation and English fields. Wang and Ke (2009) commented few of these inter-disciplinary experts have been found in the public sector. According to Ho's (2006) study, even the officials in the central and local authorities did not have the basic knowledge and skills about BOT. Ho (2006) indicated that, in some cases, the public sector managers cannot distinguish the difference between the BOT model and privatisation. Cheng and Wang's (2009) study showed that the governments and the decision-makers in China believed that with the use of the BOT model, the authorities do not need to do anything more than provide some policy guarantees. In these cases, the governments in China may underestimate their supervisory responsibilities and also the complexity of the BOT projects. This is mainly due to officials and public sector managers not having sufficient knowledge and understanding of the BOT model.

Meanwhile, some BOT managers and directors have lot of experience in managing large publicly funded infrastructure and utilities projects. However, in practice, some of these experiences and skills are not transferrable to the implementation of BOTs in many cases (Cheng and Wang, 2009). The findings of Fu and Zhong (2006) indicated that BOT managers on the public sector sides essentially do not have sufficient commercial knowledge and skills in contracting, financial and legal matters, resulting in contracts always being expensive. At the individual project level, shortage of experience and skills in public procuring authorities are common, leading to the local procuring authorities being at a disadvantage when dealing with highly skilled and 'smart' international and Chinese BOT contractors (Fu and Zhong, 2006).

In some water and power generation BOTs, notably the 7 BOT projects directed by central government, the public authorities introduced a large number of technical, legal and

commercial advisors from the UK, France and Australia into the contract tendering and negotiating stages to ensure the contract was well-drafted (Fu and Zhong, 2006, Wang and Ke, 2009). The introduction of external advisors largely improved the BOT contracting practice in these cases and temporarily filled the shortage of experts and experience in the public sector. Fu and Zhong (2006) argued that these consulting costs were very high. The literatures into Chinese BOTs (Qin and Yu, 2005, Wang and Ke, 2008) suggest that the government need the assistance of interim and external advisors' in BOT practice. Although the consulting costs were necessary, qualified advisors were able to ensure the government reached a 'good' deal in the end.

2.4.7 Transparency of Information and the implementation of BOTs

Although BOTs have been utilized in China for 25 years, little of the information and data about their utilization has been released by the Chinese government. Researchers (Ho, 2006, Handley, 1997, Fu *et. al.*, 2006) complain that the most difficult problem researching Chinese BOTs is the extremely low accessibility and availability of relevant data. China's BOT policies were not unable to accessible through the government's websites. There are a limited number of sources offering Chinese BOT project information, except the World Bank's PPI database.

It is notable that the Chinese government, as the BOT policies' designer, regulator and practitioner still has not published any comprehensive report about results and performances of BOT programmes. However there are two auditing reports produced by China's National Auditing Office in 2007 and 2008 (CNAO, 2007, 2008): 'Auditing Report on 34 Highway Road Projects' Construction, Operation and Investment Returns' (in Chinese) , and the 2nd Auditing Report in 2008: 'Investigation Report on Toll Road Projects' Construction, Operation and Management in 17 provinces' (in Chinese). Only these two reports involved and mentioned the BOT project's implementation in China's motorway industry. Instead they mainly focused on the motorway projects which were funded by the government, rather than the projects sponsored by private capital. Meanwhile, the CNAO (2007, 2008) neither clarified how many BOTs were included, nor specifically addressed the performances of the private funded projects.

There were some attempts to require the governments in China to disclose more information about the implementation of BOTs. For instance, the Ministry of Construction (2005) required local authorities to establish regular performance measurement and assessments for the BOT contractors, reviewing the projects' output every two years, and publishing a report in order to respect the public's 'right to know the truth' (MOC, 2004). There have still been very few reports published by local governments to date. Low transparency of BOT information means that few lessons can be learnt from the past failure and success of the use of BOT. The knowledge transfer between different government levels and public agencies was restricted by the low accessibility and availability of BOT data. At the same time, the public lose the opportunity to know and evaluate the performance of the government and BOT contractors. By reviewing all the studies associated with Chinese BOTs, it can be found that a large portion of the research focused on the identification of risks of BOT through surveys of the private contractors. Only a few pieces of research (Qin and Yu, 2005, Fu and Zhong, 2007, Wang and Ke, 2009, Wang, 2009, IFC, 2003) addressed the detailed problems in the 'real' BOT practice, due to these authors being officials in the governments or working as the 'think tank' and experts within the public agencies.

2.5 Summary

By reviewing the literature concerning Chinese BOTs, it is noticeable that China's BOT studies were focused on a limited area and included very limited information on the practice and implementation of BOT projects. The major findings of the research into Chinese BOTs revealed that China has a number of debates and problems in developing BOTs (World Bank, 2003, ADB, 2003, Yu and Qin, 2005, Zhang, 2007 Fu *et. al.*, 2006, Adams *et. al.*, 2006) including:

- the debates on the overall effect of the BOT's implementation,
- the degree of competition in the BOT contracting process,
- the risk transfer and allocation,
- the design and management of BOT contract,
- the underdeveloped regulatory and legal frameworks surrounding BOTs have not yet been established and developed in China, the insufficient experts and experience of managing BOT projects in the local governments,
- the low transparency of BOT information.

The results and effects of utilizing BOTs in China are not conclusive. In addition, the government has released only a limited amount of data. As the prior research (Yu and Qin, 2005, Fu *et. al.*, 2006, Adams *et. al.*, 2006) has suggested, in order to make the best use of BOTs in China, the authorities should study carefully their past lessons and experiences. It is necessary to conduct further studies of the implementation of Chinese BOTs, especially on the questions. Such as:

- Why do the authorities in China want to use BOTs in practice?
- Under what kinds of contexts and conditions will they be used?
- What have been the results of utilizing BOTs during the last few decades?
- What are the main problems and obstacles to utilizing and managing BOTs in the contexts of road and water industries at present,
- How can policies and the implementation of Chinese BOTs be improved?

The literature on China's BOTs (Adams, *et al.*, 2003, Qin and Yu, 2005) commented that the Chinese government and private sector both need to learn how to properly adopt and

manage BOTs. The Chinese government, policy makers and practitioners in the public sector have to make either a proper study of BOT-related theories or use the lessons from other countries. The World Bank (2003), IMF (2003), Barrett (2007), Qin and Yu, (2005), Adams et. al, (2006) and Chan (2010) all advocated that the UK had a well-developed PPP (PFI) system with the largest number of signed PFI contracts in the EU. The UK not only had a complete set of PFI development goals and procedures, but also a wide experience of applications within the social infrastructure. The integrity of the legal system, a 30-year history of PFI operation experience, as well as mature and well-developed capital markets, private sectors and government public management capacity are the factors as to why meant that British PFI development led the World. The next chapter will explore how British PFIs were developed and what experiences and lessons have been learnt in the UK during the past decades. It will also initially compare the PFI in the UK and China and discuss the possibilities and feasibilities of using lessons learned from the British PFIs' implementation.

Chapter 3 The Literature Review: a Critical Evaluation on the British Private Finance Initiative programme—the lessons that can be learnt by Chinese Build-Operation-Transfer

3.1 Introduction

The last chapter presented the ways in which marketisation and the various models of Build-Operate-Transfer (BOT) were identified and actively promoted by the government as strategies for delivering public infrastructure and services in China. The major findings of the existing research into Chinese BOTs revealed that China has a number of problems and difficulties in developing BOTs (World Bank, 2003, The Asian Development Bank, ADB, 2003, Yu and Qin, 2005, Zhang, 2007 Fu *et. al.*, 2006, Adams *et. al.*, 2006). The literature on China's BOTs (Adams, *et al.*, 2003, Qin and Yu, 2005) commented that the Chinese government and private sector both need to learn how to properly adopt and manage BOTs. The Chinese government, policy makers and practitioners in the public sector need to make a proper study either of BOT-related theories or of the lessons from other countries. This chapter aims to examine PFI as used in the UK, and considers what lessons China can learn from the development of the British Private Finance Initiative (PFI).

3.1.1 The increasing communications between China and the UK's PFI industries

In fact, as Holden (2009) explains, China has already begun investigations into the British PFIs and Public-Private-Partnerships (PPPs). Officials and delegates from China were sent to the UK in 2002 and 2005 to attend programmes organized by the UK Ministry of Health. The Chinese authorities, including the Ministry of Health along with the governments of Beijing, Shanghai and Guangzhou, are particularly interested in the National Health Scheme (NHS)' 'modernization' reforms and they are 'exploring further the UK models of healthcare including PFI' (Holden, 2009). Meanwhile, the major private participants in the British PFI market are enthusiastically exploring the

Chinese BOT market, thereby indirectly enhancing communication about how to implement BOTs and PFIs in China and the UK. The pioneers who introduced PFIs into China are also heavily involved in the British PPP and PFI market, including: Thames Water (water and sewage treatment sectors with Bovis) (Zhang, 2007, The Global Water Intelligence, 2010), Balfour Beatty (Gammon in Hong Kong, a railway and transport infrastructure contractor) (Balfour Beatty HK, 2010), the 'Big Four' Accounting firms (e.g. Deloitte Touche Tohmatsu, PricewaterhouseCoopers and Ernst & Young) and Pinsent Masons (legal advisor) (Pinsent Masons Website, 2010). All of these have already participated in a number of Chinese BOT projects.

It is clear that the communication and commercial activities associated with BOTs and involving the UK and China have been strengthened in recent years. On one hand, the British government and private firms believe that China is a target market for exporting the British PFI policy, because of China's large population, stable political environment, good economic performance and rapidly-increasing social demands (Holden, 2009). On the other hand, the government in China has shown its interest in the British PFIs, due to China's limited history as a market economy and as a user of BOTs.

3.1.2 The structure of chapter three

This chapter focuses on how PFIs have been used in the UK since 1992. Section 3.2 reviews and discusses the basic definitions of PFIs in the UK emphasising those mentioned in chapter one. Furthermore, section 3.2 compares and contrasts the differences between PFI and traditional forms of procurement. In addition, it looks at the key players, the governing bodies and frameworks behind the British PFI approaches. Finally, it reviews three different narratives about the British government's programmes of PFIs, introducing and explaining the concepts of value-for-money and Public Sector Comparators (PSCs).

Section 3.3 reviews the history of private participation in public infrastructure since 1979. It also concerns the contexts, ideologies, institutions and the objectives of

utilizing PFIs in the UK in recent years. It divides into three parts: part one looks at the background of PFIs, with a brief history of British privatisation of infrastructure and utilities since 1979. Part two reviews the early history of using PFIs in the UK between 1992 and 2000. And part three focuses on the development and progress of PFIs after 2000. By looking past research, the changes of contexts, conditions and policy relating to the British experience of PFIs can be traced, and any common factors and differences between China and the UK identified. In section 3.4, the problems arising from and attempted solutions on the uses of British PFIs are analysed and evaluated. In this section, the evidence for, and consequences of, using the PFIs are reviewed. The strategic and practical debates and arguments on implementing PFIs in the UK are also presented. Section 3.5 summarizes the key lessons and experiences of using PFIs in the UK and discusses what lessons potentially can be learned and what experiences can be borrowed by China. Meanwhile, some key factors and conditions for successfully implementing PFIs in the UK and investigated in previous studies are considered.

3.2 The British PFI model

The terms 'PPP' and 'PFI' were often used inter-changeably in the practices and the research in the UK (Yescombe, 2007: 4; Hall, 1998). This often leads to difficulties when comparing, evaluating and measuring the effects of the implementation of BOT in China and PFI in the UK (Akintoye edit., 2003). Hence, it is necessary to identify in the UK, meanings of the key concepts of the PPPs and PFIs.

3.2.1 The Private Finance Initiatives in the UK

The 'Private Finance Initiative' was launched by the British Conservative government in 1992 (Spackman, 2002). It is the principal model for using private finance to deliver public infrastructures and services in the UK (NAO, 2009a: 3). Reviewing the earlier studies on the PFIs, it can be found that the PFI involved a range of activities with private participation in infrastructure projects prior to 1997, e.g. DBFO model and

joint-venture model (Froud and Shaoul, 2001, Sussex, 2001). The concept of PFI was normally used as the exchangeable idea of Public-Private-Partnerships. The definition of PFI is given by the government from different perspectives and those have been discussed in chapter one.

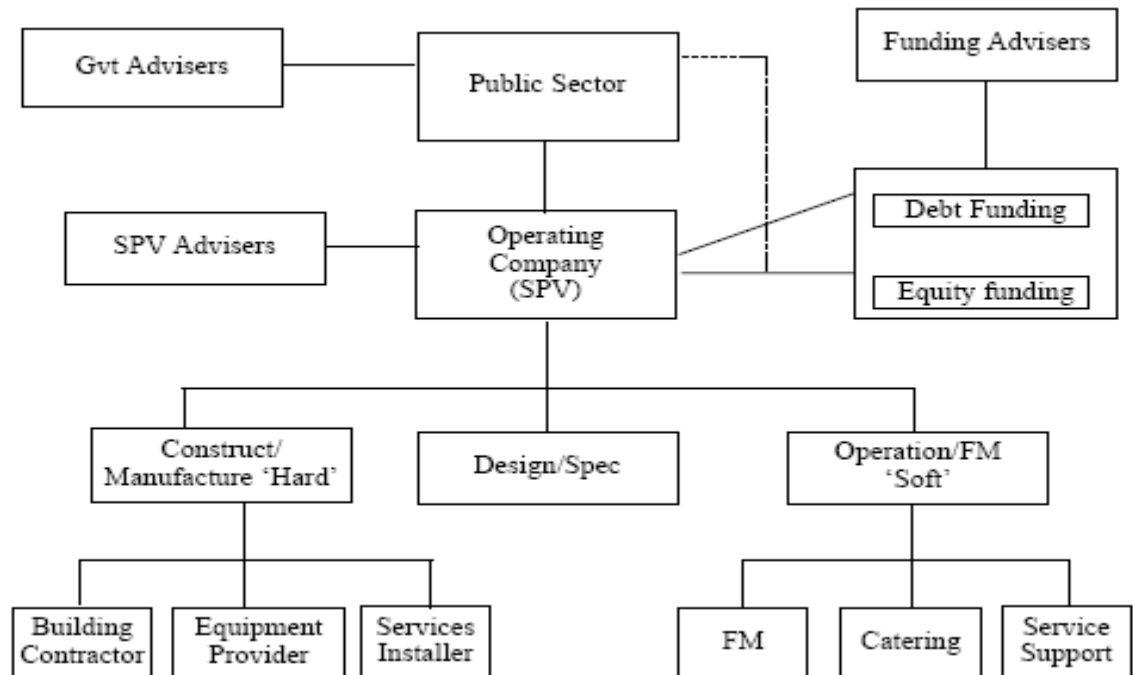
Although PFI is a policy originally created by the Conservative Government in 1992, the change of government in 1997 did not alter government commitment to it. Consequently, the Labour Government embraced and re-developed the policy into a wider concept, the Public Private Partnership. It is a policy involving the private and public sectors in government initiatives on very generic terms (Broadbent and Laughlin, 2004). PPP is broadly defined by Treasury (2000: 3) as *'a long-term partnership which can bring public and private sectors together for mutual benefits and PPPs are arrangements typified by joint working between the public and private sectors. In their broadest sense they can cover all types of collaboration across the private-public sector interface involving collaborative working together and risk-sharing to deliver policies, services and infrastructure'*. The fundamental difference between PPP and PFI is that PPP is a generic concept, while PFI is a sub-sector of PPP, with the specific purpose of delivering a service based on publicly-managed assets using private capital. Since the principal model for private participation in the public infrastructure in the UK is the PFI model, this whole thesis mainly focuses on the concepts and models of the PFIs. Meanwhile, the discussions on other forms of PPPs, such as joint ventures, will also be included in the following sections.

3.2.2 The structure of the PFI and the responsibilities of the private contractor

The private sector partners in a PFI are usually a consortium of a number of stakeholders from the private and public sectors, a so-called special purpose vehicle (SPV). The SPV consists of the main project contractors, construction contractor (subcontractors), lenders, hard (e.g. building fabric) and soft facility (e.g. catering, cleaning, security, mailroom, and health and safety) operators and maintainers, project insurance firms and, finally, financial, legal and technical advisors, see Diagram 3.1

below.

Diagram 3.1 The structure of PFI and SPV



Source: Grimsey and Lewis, 2004

Through a long-term PFI contract between the public sector and its private partners, the SPV is responsible for meeting contractual obligations (Yescombe, 2007; IMF, 2007; Grimsey and Lewis, 2004). These include: producing and delivering the defined services to the standard required by the PFI contract; designing and building or upgrading the infrastructure asset; raising funds for the capital needs of the project; focusing on government objectives; responding, in cooperation with the public procurer, to variations in the project environment; returning the assets in the specified condition, or retaining the facilities, at the end of the contract.

The different functions of design, construction, finance, operation and maintenance are integrated in the PFI projects, therefore, when adopting a PFI and for ensuring it can be successfully implemented, the capabilities of the private contractors are crucial. As Barrettes (2007) explains: firstly, private contractors should have the necessary experience and capabilities to carry out the project, especially for the large

infrastructure projects. Due to the characteristics of public infrastructure, the private parties in a PFI need strong and stable financial capabilities in order to cover the huge amount of long-term investment, whilst, the complexity and specificity of public infrastructures requires private contractors and sub-contractors to have comprehensive experience, technologies and expertise for managing large projects.

Despite the debates around the PFI contractors' roles and performance in the UK, almost all major players in the PFI market in the UK have long histories of providing infrastructure and large projects. Most of them are operating businesses in a number of countries with rich experience and capabilities for carrying out PFI projects, while although these capabilities were deeply weakened by the financial crisis in 2008 (PUK, 2009, NAO, 2009 a). Compared to other countries in the world, the PFI market in the UK is well-developed. The related PFI industries and markets offer the transnational companies the opportunities to participate in the PFI programme (e.g. the second largest banking and capital market in the world, world-class project construction contractors, subcontractors and advisory industries). According to PUK (2007) investigations in the period 2004-2007, there is a broadly-based group of top private sector participants in the British PFI market. These are shown in table 3.2.

Table 3.2 The major private participants in the British PFI market

<i>Sector and Roles in the Projects</i>	<i>The main participants in the Market</i>
Project Sponsors (Investors)	AMEC, Balfour Beatty, Bilfinger Berger, Barclays, Bank of Scotland, HSBC, RBS, Innisfree, Equion/John Laing, Skanska.
Lenders and Banks	RBS, Bank of Scotland, SMBC, Dexia, NIB capital, DEPFRA, EIB, Bank of Ireland, Barclays, Lloyds TSB.
Construction Contractors	Balfour Beatty, Skanska, AMEC, Carillion, Bovis, KBR, Laing O'Rourke, Taylor Woodrow, Costain, Interserve.
Hard Facility Management Contractors	Balfour Beatty, Skanska, AMEC, Carillion, Taylor Woodrow, Interserve, Mitie, Amey, Thames Water, Sodexo.
Soft Facility Management Contractors	Balfour Beatty, Carillion, Interserve, Mitie, Amey, Sodexo, Kier, Robertson, Integral.

Financial Advisors	PwC, Deloitte, Grant Thornton, KPMG, Ernst & Young, Robson Rhodes, Quayle Munro, Abros, Macquarie, Investec
Legal Advisors	Pinsent Masons, Addleshaw Goddard, Bevan Brittan, Eversheds, Shepherd & Wedderburn, Nabarro Nathanson, Denton Wilde Sapte, Dundas & Willon WS, Wragg and Co., CMS Cameron McKenna.
Technical Advisors	Mott Macdonald, Turner & Townsend, EC Harris, Cyril Sweett, Currie & Brown, Gleeds, Faithful & Gould, Davis & Langdon, WS Atkins, Appleyards Consulting
Insurance Companies	Willis, Aon, Marsh, JLT, Heath Lambert

Source: adapted from the PUK, 2007, PFIs: The State of the Market,

3.2.3 The roles of government and the public sector in the PFI

The roles of government and the public sector also changed when the PFI approach was adopted. PFI differs greatly from traditional procurement methods, since the government does not participate into building the assets and facilities. It adopts the role of a ‘buyer’ and ‘provider’ of public services as defined in the PFI arrangements. Under the traditional public sector procurement approach, the projects are usually funded from tax revenues or public borrowing and government adopted a model, known as ‘Design-Bid-Build’ (Yescombe, 2007: 4). In this way, the government has to fund the full cost of construction, including any cost overruns, in other words, the government and the public sector accept all risks related to the projects. At the same time, the operation and maintenance of the projects or facilities also remains in the public sector. The private contractor is only responsible for the quality of the facility during the specified construction-warranty period.

However, as the government argued (Allen, 2003), the use of PFI does not mean that the government withdraws from the management of public projects. As Grimsey and Lewis (2004) and the OECD (2003) pointed out, the public sector remains accountable for many aspects of PFI projects. In principle, the government and public sector parties have to clearly define the services required and specify the outputs. In addition, as

procurers and clients of public services, the public sector has to make sure they have the resources (e.g. budgets for PFI payments) available to pay the private contractors. Secondly, for selecting the best contractor, the government, as the project's organiser, also has to carefully design and plan the procurements of PFI projects. Furthermore, as regulators and inspectors of the PFI, the government needs to determine the performance regime by setting and monitoring safety, quality and performance standards for those services and manage the contract by enforcing these standards, whilst taking action if they are not delivered. Finally, the public sector, as both the partner of the private sector and as an agent of the people, has to manage the local community and other social expectations of the projects and secure public satisfaction.

3.2.4 The procedures and the complexity of the British PFI contracts

Thus, the government plays different roles in the PFI arrangements and a number of stakeholders from the public and private sectors are involved in the projects. From the public sector's perspectives, normally there are at least fourteen stages, involved in the implementation of a PFI can be itemised as follows (Allen, 2003, De Lemos, et. al., 2003): establishment of business need, appraisal of options, development of business case, expression of interest, bidding/design/short list development, negotiation/final evaluation, contract award and financial close, construction/development, operation (servicing, monitoring, maintenance), contract management, end of contract.

Compared to the traditional procurement route for public infrastructure, PFI is more complex, due to its complicated procedures (e.g. the value-for-money tests), complicated contracts, subcontracts and agreements and the complex relationships between the PFI contractors, subcontractors and other stakeholders. Notably, the complexity of a PFI contracts lies not only in the main contract between the authority and the contractor, but also in the other parallel contracts that have to be signed among the private parties and their advisors (De Lemos, et. al., 2003). There are a number of other types of legal agreements that have to be signed in addition to the PFI main contract (NAO, 2008): for instance,

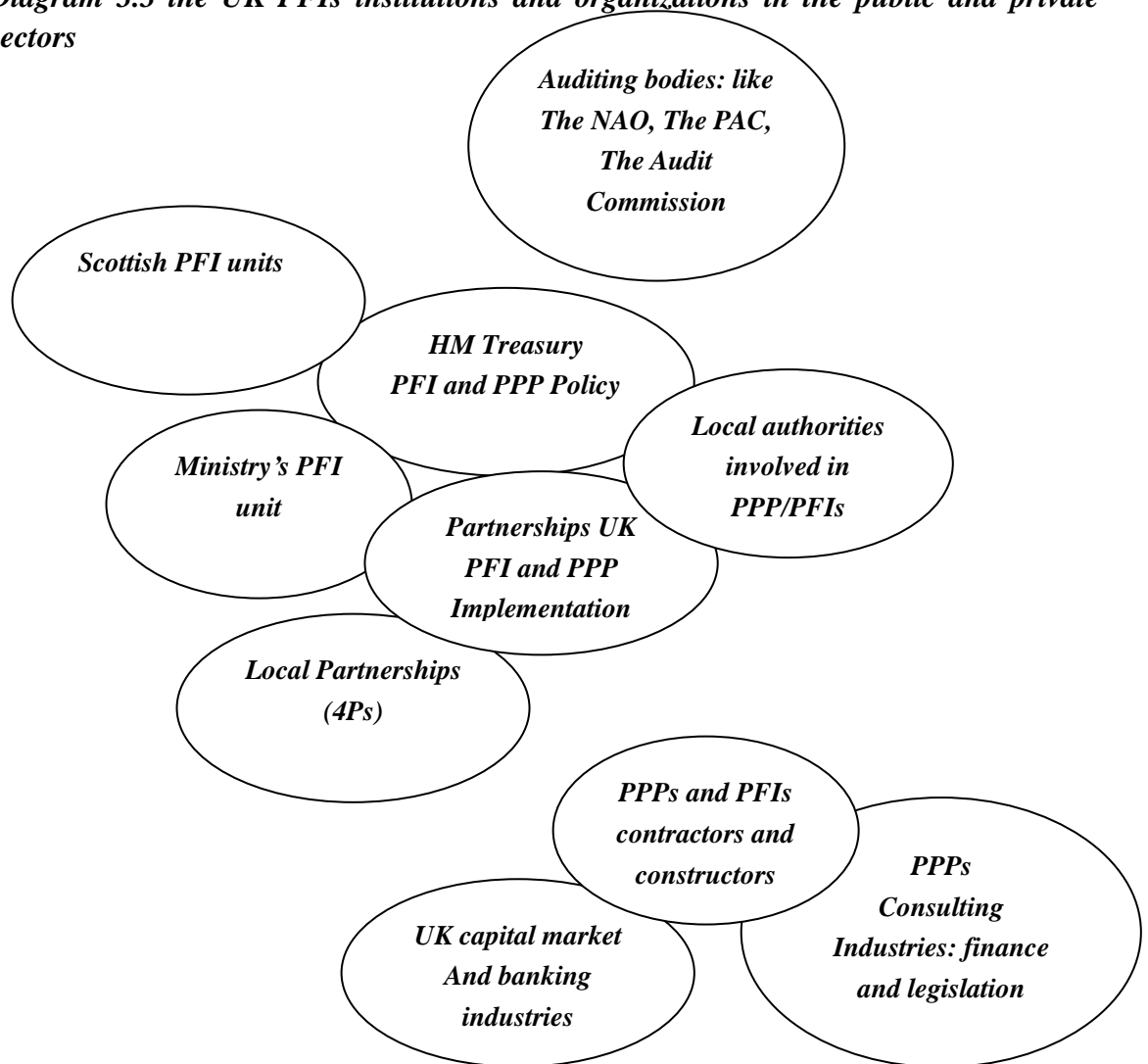
- *The contractor contract (the agreement and legal documents defines the SPV as the new, autonomous, legal entity, wholly independent of its parent companies);*
- *Sub-contracts between contractor and subcontractors; loan agreements with financial institutions and lenders;*
- *Direct agreements between the authorities and senior lenders;*
- *Shareholder agreements;*
- *And consulting services agreements with legal, financial and technical consultants.*

3.2.5 The British PFI governing structure and institutions

To handle the PFI programme as a whole, and to deal with individual projects case-by-case, PFI policy and implementing bodies at both central and local levels have been developed, see Diagram 3.3, page 102. By 2008, several kinds of institutions had been established and involved in managing PFIs in the British public sector, such as the PPP unit in H.M. Treasury, Partnerships UK and the related PFI departments in the government ministries, the local authorities and the 4Ps (now taken over by Local Partnerships, 2009). The taskforce and policy team in H.M. Treasury are responsible for managing PFI policy as a whole. In the last two decades, the Treasury has published a range of key policy, guidance and statistics on PFI and provided advice to those undertaking or wishing to undertake PFI projects (Treasury, 2009). Also, the PPP department in the Treasury (Project Review Group, PRG) oversees the approval process for any PFI projects at local level which receive government support (Treasury, 2009). Partnerships UK was established in 1999 to implement PFIs and PPPs through a form of joint-venture between the government and the private sector, to support and provide advice for the public and private sectors involved in the PPPs (PUK was disbanded in later 2010). Also, PUK are charged with research, and regulatory roles and may even participate directly in some PFI projects, such as BSFs (Building Schools for the Future)

(PUK, 2010). Finally, unlike the Chinese BOT auditing system, the UK has independent organizations to evaluate PFI and PPPs' performances and operations for local authorities, such as the National Audit Office, the Public Accounts Committee in Parliament and the Audit Commission (restructured and contracted out in 2011). From 1997 over 80 reports were produced by the NAO, focusing on the value-for-money in various Private Finance activities including PFI and PPP. The evaluation by the NAO involved not only the individual PFI project, but also the PFI as a whole programme of development for infrastructure and services. The NAO looked at operational performance, financing, the tendering processes and benchmarking, good practice and negative lessons (NAO, 2009a, 2010).

Diagram 3.3 the UK PFIs institutions and organizations in the public and private sectors



3.2.6 Three different narratives on the British PFI programmes

Since the introduction of the PFI in 1992, there has been a wide discussion on this programme based on both theoretical and pragmatic narratives. Although PFI has been in operation for more than a decade, much of the evidence as to its impact is still contradictory and inconclusive (NAO, 2009a).

First of all, the government has argued that PFIs have been adopted as pragmatic solutions to a number of practical difficulties in developing the infrastructure in the UK (Treasury, 2003, Allen, 2003, Parker, 2009). The PFIs were developed in the UK, because the governments at various periods had been faced with difficult choices, especially the fiscal challenges of the 1990s and 2000s. Under the Conservative administration, there was a pressing need for investment in infrastructure after years of capital starvation and there was a belief that the introduction of private capital into the financing of public sector projects and service delivery would help reduce public borrowing (Clark and Root, 2000). Kerr (1998) revealed that PFIs were favoured by the Conservative government (1979-1997), since it was keen to limit tax-rises and increases public investment in infrastructure.

The PFI programme was also attractive to the Labour government, although they had opposed it before coming into office. The official document (Allen, 2003) explained that the major reason for expanding this programme was that PFI enabled the Labour government to get closer to balancing their fiscal budget without a large increase in either taxation or borrowing. At the time, two fiscal rules were introduced in 1997: the Golden Rule and the Sustainable Rule, the aim of which were to restrict the government borrowing to investing only in the projects that will benefit the future. This was instead of funding current spending over the economic cycle, and limiting public spending and debts to a certain level (forty percent) of the GDP.

However Quiggin, (2002), Dawson (2001), Heald (2003), Edwards, et. al. (2004), and Hellowell and Pollock (2009) argued that private finance is more expensive than public

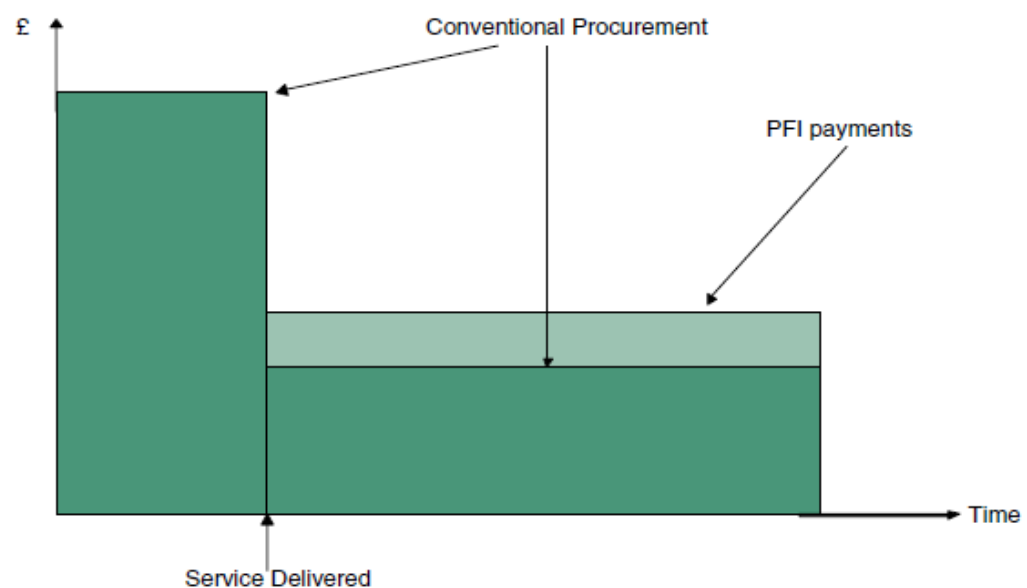
funding, due to their costs of capitals and the higher transaction costs. At same time, the use of PFI as governmental off-balance sheet financing is just a ‘fiscal illusion’. PFI still would influence the government’s fiscal situations in the future for the future generations, although it may balance public spending and significantly cut public debts at present.

The second narrative believed that PFIs on a kind of liberation and marketisation on the public infrastructure. Both Conservative governments (1979-1997) and Labour government (1997-2010) actively deployed the PFI programmes because of their pro-market and pro-private beliefs. The assumptions of the governments are clear as discussed in the official documents of the Treasury (2000, 2003a): as the private sector, with profit motive incentives, is more efficient, the private provision of public services will lead to increased efficiency and wealth from which all will benefit. Public sector construction and infrastructure projects have traditionally had a reputation for being poorly managed, leading to cost and time overruns and long-term technical problems (Dixon et. al, 2005; MacDonald, 2002). Since this ideology was identified by the politicians in the UK, marketisation of public infrastructure is unavoidable. The governments and proponents of the PFI claimed that this policy could achieve ‘value for money’ in public services through competitive bidding in PFI procurement, transfer ‘operational and financial risks’ to private contractors and introduce the skills of ‘advanced management, expertise and innovation’ to the public sector (Treasury, 2006).

Value-for-money (vfm) is a concept originally used in accounting as a measure for performance-auditing in economics. However, it is often used by governments and the public as ‘*an examination designed to determine whether the organization is performing economically, efficiently and effectively in its use of resources, operations, procedures and the pursuit of objectives*’ (De Lemos, et al., 2003). When the PFI was introduced into the U.K., the concept of VFM was reinstated by the Conservative government at the same time. The government claimed that the introduction of efficient private management into the public infrastructure would achieve VFM through the application

of PFIs (Treasury, 2003a) . In 1998, the Labour government's PFI programmes also put the emphasis on the concept of VFM, and introduced a way of testing VFM, the so-called **public sector comparators (PSCs)**. In the British PFI appraisal processes, the PSC was defined as: a hypothetical, risk-adjusted costing carried out by the public sector as a supplier, to an output specification produced as part of a PFI procurement exercise. The purpose of the PSC is therefore assumed to provide a benchmark against which to form a judgment on the VFM for PFI bids in the PFI procurement process (NAO, 2003:45). In principle, PSC is a theoretical test to identify if the government should produce the public services and build public facilities 'in-house', or just 'buy the services' from the private contractors in the market. By calculating and estimating the price of private provision (PFI) and the costs of the 'in-house' production of public services and projects (in terms of Net Present Value, NPV), the government would make a decision on the adoption of PFI or not. The 'cheaper' method (between the PFI and conventional approach) would be chosen, see Diagram 3.4.

Diagram 3.4: PSC in the PFI appraisal process



Source: NAO (2004)

PSCs have been attracted considerable debate concerning their reliability, accuracy and relevance in the contexts in which they have come to be used (Coulson, 2005; Shaoul, 2005, NAO, 2009a). This was seen in cases where the PSC has been incorrectly used as a pass or fail test. In cases when there is an absence of any public funding for the government, the PFI deal is always calculated as a 'cheaper' option than the conventional approach (NAO, 2003, 2009a). As a result, the PFI had to be 'the only game in town' (UNISON, 1999). Thereby, for the authorities in the UK, it has become the only option to develop public infrastructure projects, especially for the health and education sectors (Economic Affairs Committee, 2009) .

Another key principle behind PFI is claimed by the government and its supporters (H.M. Treasury, 2003, Grimsey and Lewis, 2004) that it encourages the allocation of risks to those most able to manage them. By doing so, PFI hopes to achieve the better risk management so as to achieve overall cost efficiencies and greater certainty of success. The optimal allocation of risk is a key determinant of the value for money of a PFI project. It can be identified in the standard contracts and the due diligence work done by lenders, who may resist some elements of the risk transfer (NAO, 2009). However, the critics such as Heald (1997b), Froud (2003), Edwards et al. (2004) , and Shaoul (2005) provide evidence that the public sector may be paying an extremely high price for this transfer of risk, in terms of the implementations of the PFI in health and road sectors. In some cases, the risks were essentially transferred back to the government. The risks and uncertainties associated with PFI projects over a period of thirty years are difficult to identify in practice, because of the nature of incomplete contracts as revealed by the 'contract theory' (Flynn, 2007).

A third narrative treated the PFI as a policy controlled by the private sector and with benefits to the private sector. Shaoul *et. al.* (2007) debated that everyone may notice the privatization (including the PPPs and PFIs) of large-scale industries and utilities, but few people have noticed that policy formulation itself was privatized. A few authors (Farnsworth and Holden, 2006, Shaoul, *et. al.*, 2007, Ruane, 2010) showed their deep

concerns on the increasing roles of the private sector on formulating and shaping public policies. These researchers explored that the ongoing expansion of the British PFI programmes was the result of 'private sector control and domination over public policies' (Shaoul *et. al*, 2007). The related analysis of the PFI markets in Britain (Shaoul *et. al*, 2007, Ruane, 2010, PUK, 2009) looked at a small number of accounting businesses (e.g. the Big Four) and on how multi-national companies have increasing influences on design, formulate and shape the British public policies via various formal and informal channels.

The study of Shaoul *et. al*, (2007) revealed that the use of private sector advisors in the British public sectors (mainly from the Big Four accounting firms) in order to develop and manage the government's Public-Private Partnerships policy, has led to the privatisation of policy formulation and implementation. The PFI policy and appraisal procedures, individual appraisal projects, and advise to both public and private sector clients were developed by financial advisors from within the industry. Meanwhile, policy evaluation also was conducted by the same group of personnel. Notably the senior positions in the PPP department in HM Treasury, the Partnerships UK, the NAO and the Audit Commission, were occupied by former employees of the Big Four firms, the businessmen and bankers who originally were from the private sector and still keeping tight relationships with the major companies in the British PFI market (Ruane, 2010 and Farnsworth and Holden 2006). Ruane (2010:10) argued '*the implementation of British PFI is potentially and essentially transferring the public fortune from the state to private sectors in the next twenty or thirty years: Thereby PFI is a policy making 'private profits from the public purse'*'. The report of PAC (2011) showed that the private contractors benefits more from PFI than the taxpayers. By considering other difficulties and problems of utilising PFIs in the UK, Farnsworth and Holden (2006) argued that these programmes and policies are fundamentally wrong.

By reviewing the literature and the three different narratives about utilizing PFIs in the UK, it can be seen that the PFI is one of the most controversial programmes of the last

decade. However, the British experience and lessons on utilising PFI are still useful references. And what may offer some positive and negative examples to Chinese BOTs. The next two sections review the history of the British PFI since 1979.

3.3 The history and background of developing PFI and in the UK

This section reviews the history and context of private participation in public infrastructure since 1979. It is divided into three parts. Part one looks at the background of PFIs, and the campaign for the privatisation of British infrastructure and utilities since 1979. Part two reviews the early history of using PFIs in the UK between 1992 and 2000. Part three focuses on the developments of PPPs and PFIs after 2000. By looking at their history, the change of contexts, conditions and policy of the British PPPs and PFIs in the last decades can be examined.

3.3.1 Privatisation on the British Public Industry and Infrastructures

For most of the post-war period, like many other countries in the world, the government and state-owned enterprises have been the principal providers of infrastructure in the UK. The earliest initiatives to marketise the infrastructure in the UK were the privatisation of the public utilities and infrastructure. A number of elements of the public infrastructure were sold-off or privatised by the Conservative governments of Thatcher (1979-1990) and Major (1990-1997) (OECD, 1998). With the massive scale of privatisation in the UK in the 1980s and 1990s, the state no longer directly participated in providing public infrastructure for these industries. Instead, the government sought to regulate the prices of the services delivered by the private sector. The changes in British public infrastructure industries since 1980 have largely reflected on the changes of contexts and ideology (Grimsey and Lewis, 2004; Martin and Parker, 1997; Parker, 1999; the OECD, 2003). Due to the ‘oil shock’ of 1973, followed by a period of high unemployment, high inflation, low GDP and productivity growth, the UK economy had been deeply weakened by 1979 and given the name of *‘the sick man of Europe’* (Parker, 2003). The state-owned enterprises and industries in Britain were widely criticized as being inefficient and over-staffed (OECD, 2003). Martin and Parker (1997), Pollitt (1999) and the OECD (2003:20) summarized these debates on the state-owned enterprises highlighting its poor management and incentive schemes, poor design and

monitoring and evaluating system, strong influences from the 'self-interested' Trade Unions, their monopoly structure, insufficient consumer-oriented and with ineffective regulations. Meanwhile, the ideological changes in the 'welfare state' system and the theoretical support from the New Institutional Economics made the UK actively promote the privatisation of British infrastructure industries in the 1980s and 1990s. Therefore, the rationale behind the British privatisation programmes was to reduce government involvement in industries, weaken the public sector unions, reduce public sector borrowing and debts, raise revenue through asset sales within the public industries and introduce competition and improve efficiency and productivity in the related industries.

A large number of studies have been conducted on the effects of the deregulation and privatisation of SOEs in the UK over decades. The findings and results are mixed, as presented in the previous studies. Based on the survey of Pollitt (1999), the overall impact of privatisations in the UK is that it did reduce government ownership of industry (from 11% of British GDP in 1979, to about 2% of GDP in 1999). Second, as the OECD (2003) showed, a huge amount of privatisation revenue was raised from the selling-off of public assets. In the short term in the UK, it did help the government's fiscal problems, especially when the large privatisations of the telecom, gas and water industries took place in the late 1980s. However, this policy of privatisation in the UK was criticized as 'selling the family silver' since, although privatisations may raise money in the short term, they will also influence the government's future, long-term revenue. In addition, Parker (2003) revealed that *'the empirical evidence (of privatisation in the UK) is that...ownership change (privatisation) on its own does not appear to have a significant effect in terms of improving economic performance where there is market dominance. This is especially in terms of welfare gains to consumers. Management in monopolies may seek an 'easy life' whether in the private or public sectors since the private-sector monopolies' management can meet investors' expectations of profits by simply raising prices'*. The studies by Pollitt (1999), Parker

(2003) and the OECD (2003: 45) indicated that *‘in general the UK evidence is consistent with the economic theory that competition is the best method of reliably generating economic efficiency gains, followed, in the absence of competition (in some natural monopoly industries) by effective regulation, and lastly privatisation.’* Furthermore, the OECD (2003) and Parker’s (2003) studies showed that in the early days, the largest beneficiaries of privatisation in the British utilities industries were: the government and also some shareholders and investors of firms. This was until competition or regulatory pressures became effective in the late 1990s. This was also because very high privatisation revenues and very high rates of return were generated after the privatisations of the gas, water and telecom SOEs.

The most important experience of the UK’s privatisation (OECD, 2003, Parker, 2003) revealed that the role of government in regulatory governance, the method of developing regulatory frameworks, and the development of regulatory tools, notably the ‘price-cap’, are crucial for ‘efficiency improvement’ and public industries’ reforms, especially for ‘natural monopoly industries’, e.g. water, sewage, electricity and railways.

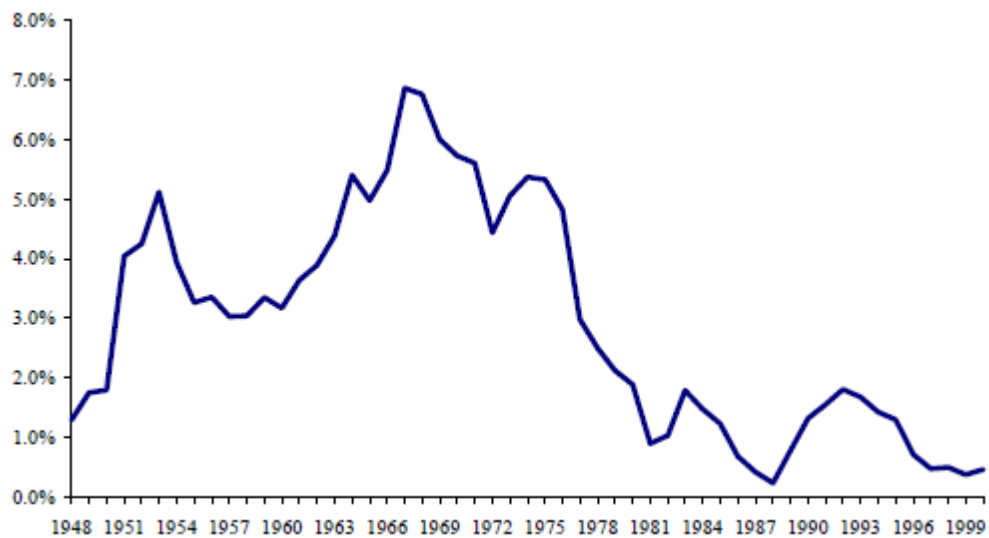
From the early 1990s, marketisation and privatisation in the UK’s infrastructure have not been limited to the ‘infrastructures’, such as telecoms, ports, water, electricity and railways, but also involved the IT, education and health sectors where more ‘soft services and products’ are involved. The forms of marketisation of the public infrastructure in the UK also changed from privatisation to PFI.

3.3.2 The introduction of the PFI in the UK: the British Experiences and Lessons in the period of 1992-2000

As Broadbent et. al. (2004:6) reviewed, *‘to the Conservative government, privatisation is the ideal solution to the infrastructure problem, but the majority of the state enterprises that could be privatized had been, left the government needing new ideas to involve the private sector in the public sector’*. Consequently, from 1992 the emphasis of the government had arguably shifted to using the private sector to design, build, own

and operate government facilities and provides public services: The PFI, a new type of programme was created by John Major's government in the UK. By considering the rationales behind the policy and the socio-economic contexts at that time, a number of authors agreed that the original utilization of the PFI was due to the government facing serious fiscal challenges and increasing demands on public infrastructure investments. See, Figure 3.5 below, the Conservative government claimed the use of PFI, would introduce additional private finance without increasing public spending and debts (Willets and Goldsmith, 1988).

Figure 3.5 Net Public Investments as a Percentage of GDP, 1948–2000



Source: Clark et. al., 2001

The Conservative administration of the early 1990s was keen to limit the size of public sector borrowing requirement (PSBR), and keep tax-rises to a minimum. Under the Maastricht Treaty's limitations (the country's fiscal deficit should remain under 3% of the GDP, and the public debts should be controlled under 60% of the GDP) (Sawyer, 2006). However, the attempts of the government to control public spending and deficits at the time were challenged by

- the British economic recessions between 1990 and 1992 (Clark, et. al., 2001): the falling GDP (-1.4% in 1990 and 0.2% in 1992);
- the increasing deficit ratio with the GDP (-1.6% in 1990, -7.9% in 1993);

- the increasing unemployment level (10.2% in 1993, with a total of over 3 million).

Therefore, there was an urgent need to increase public investments, but, to do this the government had limited financial options. The PFI was arguably created by the government, to raise the investments on public infrastructure and social services, whilst not increasing public spending. The initiator was Willetts and Goldsmith (1988) (now, the Minister of state for Universities and Science, in 2011). Based upon these controversial beliefs, the PFI was implemented by the Conservative government in 1992. It claimed that *'the Government would actively encourage the private sector to take the lead in joint ventures with the public sector; the public sector would have greater opportunity to use leasing where it involved significant transfer of risk to the private sector and offered good value for money'* (the speech of Norman Lamont, quoted from Broadbent, et. al, 2004: 4).

The intentions of the 1992-1997 conservative government was that PFI would improve the provision of public services and infrastructure through:

- 'better allocation of risks;
- better incentives to perform;
- close integration of service needs with design and construction;
- a clearer focus of responsibilities of public and private sectors which more clearly reflects the strengths of each;
- a continuing commercial incentive for efficiency throughout the design, asset creation and operation of the project;
- more potential for efficiencies' (Private Financial Panel, 1995, cited from the Sussex, 2001:26).

As Parker (2009) revealed, in some cases, the PFI had been seriously considered by the

government prior to 1992. However, only two projects were finally approved by the government who signed a contract with the private sector in 1988 and 1992: the Dartford Crossing Bridge PFI, which included a DBFO bridge and two tunnels; and the second Severn Crossing PFI, which is also a bridge project connecting England and Wales. Many applications on using private finance at the time were rejected by the government, because they did not conform to the 'rules' and/or 'conditions' of using private finance in public industries. These rules were mainly formulated by a senior official, Sir William Ryrie, and became known as the 'Ryrie Rules'. The Ryrie Rules' mainly covered two concepts: Firstly, *'a project funded by the private sector should go ahead only if it could be demonstrated as more cost effective than a comparable publicly funded project; and secondly, it should result in a corresponding reduction in public spending* (this rule was subject to individual exceptions by Ministers and was abolished in 1989)' (The Treasury Committee, 2000, Allen, 2003). Due to the government being able to borrow money at a lower interest than private firms, the first Ryrie rule required the net yield of a PFI project should be greater than if it were publicly financed. This would have to be at least enough to cover the increased cost of raising risk capital from the financial market (The Treasury Committee, 2000). In other words, *'the gains (and benefits of PFI) would have to more than offset the additional cost of raising finance from the private sector, compared with gilt sales, if the proposal was to be approved'* (Parker, 2009: 3). The second rule defined that private finance should be used only as an alternative, and not in addition to public finance. This rule was designed to ensure that private finance was not used to circumvent public expenditure constraints by government departments. So when private financing was used, the public expenditure would be reduced pound for pound correspondingly (Ruane, 2010, Pitt *et. al.*, 2006). The effects of the implementation of the Ryrie Rules, was that a number of proposals using private finance were rejected by the Treasury, because the applications did not meet their requirements (Parker, 2009). At the same time, the government departments involved had little intention of using private finance,

owing to the fact that private financing would not bring ‘extra funding’ to their departments (*Palma, et. al.*, 2009).

The Ryrie Rules attracted a number of debates and critics, mainly from the supporters of private participants in public industries in the government. Some claimed that ‘Ryrie Rules’ are so tight as to make them inoperable and ‘*no pound of private /public investment was allowed through under the Ryrie Rules*’ (Parker, 2009:3). As Willets argued in 1993: ‘*the notorious Ryrie rules were a tease — the conditions they set for privately financed projects were never likely to be met in practice*’ (Hall, 1998:3). Meanwhile, as the designer and regulator of the rules, the Treasury was criticised to prevent private finance into public projects (Clark and Roots, 1999). Given these debates, the Ryrie Rules were gradually retired in 1989 and then completely abolished by the government in 1992, so removing the ‘barriers’ to the introduction of private finance.

While, the abolition of the Ryrie Rules are also controversial, as Parker (2009:3) debated that with careful guide, the PFI scheme demonstrated that the Ryrie rules were not the formidable barrier to private financing of public infrastructure, e.g. the Dartford PFI in 1986. Moreover the abolition of the Ryrie rules was also argued that some safeguards for the public purse were removed (Ruane, 2010).

However, in practice, with the abolition of the Ryrie Rules and the launch of the PFI programme in 1992, these initiatives did not lead to as much private finance as the government anticipated. According to the data of PUK, H.M. Treasury, NAO (2009a) and Greenway et. al. (2004), only ten PFI contracts had been signed by 1993, and the majority of these were small, such as a student accommodation project in Greenwich, two prisons projects in Bridgend and Frazakerley (Liverpool), a waste treatment plant in Dundee, and a small health project in North Lanarkshire etc (PUK database, 2009).

Furthermore, immature PFI met a number of challenges in terms of the policy’s implication from the institutions of government. Through interviews with senior officers who had participated in the PFI at the time, Greenway et. al. (2004) revealed that the

PFI programme progressed slowly in the earlier years, due to the fact that the policy was launched across all government departments rather than within a single one. It therefore had to involve people from different areas of the public sector with potentially dissimilar views and approaches. As Greenway et.al., (2004) revealed, PFI is a radical change in the way the public are delivered goods and services, and requires that the working practices and dominant culture of public sector procurers at the grass roots level need to change. PFI may bring fundamental changes to organizational culture, echoes and values in the British health system. Thereby the implementation of PFI was received with suspicion and considerable opposition in the public sector, particularly the health sector. Finally, the policy had been rather rushed into, without much consideration being given to the technical issues in practice, as an official who had worked in the Ministry of Health at the time commented that ‘...when it (PFI) was launched, then we had to solve the problems as they came up ... there was not an appraisal of what [the policy] meant and a financial [appraisal] as to whether it was the best way of doing it. It just looked as if that was a solution’ (the interview with Yates, by Greenway, 2004: 512). There was a big gap between the ideologies of the policy decision-makers and the practice of policy implementation.

In terms of the institutional and technical difficulties experienced in implementing the PFI, the Private Finance Panel and Executive was created within the Treasury in 1993, comprising personnel from both the public sector and private sector. They were responsible for encouraging, providing case-specific advice, and producing general guidance documents on the PFI programmes. However, PFI was still slow to start and the evidence showed that, only three projects were signed in 1993 and 1994 (The Treasury Committee, 2000). Up until the mid 1990s, PFI failed to produce the levels of investment planned (Fitzsimmons *et. al.*, 2008).

For promoting and increasing the uses of PFIs, the Treasury declared a ‘universal testing rule’ in 1994, which meant the Treasury would not approve any further capital investment projects without a primary exploration of the use of private finance. This

meant that public sector bodies and local governments were eventually forced to work with the PFI if they needed any form of capital investment. Although the launch of the universal testing rules led to an increasing numbers of PFI contracts (39 in 1996) (Spackman, 2002), these rules have been argued by a number of researchers. Broadbent *et. al.* (2004: 7) stated, the ‘universal testing’ policy did not consider the costs involved and the effects of this change. It was an ideology of the Conservative government that the private sector could solve the problems within the public sector. Institutional problems also came with the launch of the ‘universal testing rule’. The public sector, such as the Treasury, line ministries and local authorities were not ready to deal with sharply increasing numbers of PFI applications. Especially at the level of individual projects, they lacked the specialist knowledge and skills needed initially to carry out the PFI process through to completion (Fitzsimmons *et. al.*, 2008). Because of the absence of standard procedures and processes to carry on the projects, Greenway *et. al.* (2004) showed that huge differences were found in PFI projects by different departments and local councils. For several similar PFI NHS projects with common features, they had quite different terms in the contract, since PFI standards were absent. By recognizing the difficulties and problems in the PFI practice in the earlier years, some policy and technical guidelines on the programme were published in 1995 and 1996. These included: how to design the contract of PFI (PFP, 1996a, 1996b) and how to conduct a procurement process in the PFI contract (PFP, 1996c). Meanwhile, the Public Private Partnerships Programme (4Ps) in began 1996 with the aim of bringing about increased investment in local services through PFIs (Broadbent *et. al.*, 2004, 4Ps, 2007).

The review on PFI’s earlier history indicated some lessons: It was noted that the UK was experiencing a severe recession at the beginning of 1992. In those days privatization as a major substitution policy (of PFI) was already attracting and absorbing a huge amount of private capital from the markets within the UK. Private investors were not ready to make other big investments on public infrastructure and

services (for the PFI), after consideration of the conditions of the capital market and private sectors in the UK. In addition, as Sussex (2001) suggested the slow progress of PFI programme in 1990s was also because the major private investors were unfamiliar with PFI policy and public infrastructure industries, especially the NHS PFIs. Sussex (2001) believed the private sector tried to avoid investments on unfamiliar projects, due to the investors not fully understanding the operation of public industries, e.g. the health sector, but also they could not identify the risks and their position associated with PFI . Meanwhile, the PFI as an immature public financing policy covered all major sectors in public industries. The Conservative government at the time probably underestimated the difficulties and resistances in the government, public sector and the industries. The PFI was launched without good preparation, for example, there was no evidence that any pilot studies or wide consultations had been done before the uses of PFIs in 1992. And thus there was insufficient consideration given to possible problems after the policy's implementation as explored in this section. The adoption of the policy in road industries might be acceptable, as the industry was more familiar with using a 'contracting approaches' and had more experiences on dealing with the private sectors. However, it was too early to expand the immature programme to other industries, such as the public health industries, where the organizational cultures and values were in sharp contrast to the ideas that underpinned the PFI.

The government was too rushed and too subjective in introducing the 'universal testing rules' in 1994 to promote the PFI's implementation within public infrastructure and social services. The Conservative government did not conduct a wider consultation on the public. It is arbitrary that the government was so anxious to introduce the immature PFI programme into all major public infrastructure and social services, without convincing evidence that the PFI could improve things. The government might have concentrated initially on one two areas or sectors and then rolled out to other sectors later.

Historically, there is some evidence that showing that the public infrastructure and

social service SOEs in the UK did not perform well. However, this does not prove that the private sector could do any better in these fields (Broadbent and Laughlin, 2004). There is no solid evidence that the PFI were performing well at the time. Moreover, it is arguable that *'the Conservative governments of 1979-1997 were not enthusiastic about mounting large-scale evaluations of their management reforms. Ministers tended to take the line that reform was essential and self-evidently desirable, and that formal, public evaluation might prove a delay and distraction'* (Pollitt and Bouckaert, 2004: 296). Based on this thinking, there was no evaluation or proper examination of the various claims made by PFI's in practice e.g. value-for-money and risks transfer. Since the Ryrie Rules were abandoned by the government in 1992, private finance continued without any comparison to similar public projects which might show they were a better option to conventional projects.

After the Labour Party came to office in 1997, the successive Labour governments strengthened, and re-developed the PFI programme. An evaluation was conducted by Malcolm Bates, and a report with 29 recommendations to improve the implementation of PFI's was issued (Allen, 2003). As one consequence of the Bates Review in 1997, a Private Finance Taskforce was created inside the Treasury as a substitute for the Private Finance Panel in September 1997. It provided technical advice to government departments concerning the design and approval of specific projects. The taskforce consisted of eight middle-ranking executives from the private sector (Broadbent and Laughlin, 2004). The department also was responsible for publishing a series of guidelines, policy statements, technical notes and case studies at the time.

The Private Finance Taskforce had been appointed for a two-year period and, as it neared the end of its projected lifespan, Malcolm Bates was reappointed to undertake a second review in 1999. Consequently, upon the suggestions of the second Bates Review, the Partnerships UK and the Office of Government Commerce (OGC) were established in 1999. Some of responsibilities of the Treasury Taskforce were transferred to Partnership UK in 1999 and thereafter the PUK managed and reviewed the specific

projects over the whole country until 2010. However, unlike other public bodies, the PUK largely relied on the private sector and was eventually managed by personnel from private finance institutions. As a public-private joint venture, the majority interests in PUK (51%) are held by the private sector and only a minority of non-executive directors from the public sectors represent the government interest (PUK, 2010). At the same time, the OGC was established in 1999 to formulate and develop policies and guidance on the PFI (although the private finance unit in the OGC was transferred back to the Treasury in 2003).

The PFI rapidly expanded under the Labour government, between 1997 and 2000 and there were nearly 250 projects that reached a financial close, from all major infrastructure and public service industries. The Blair Labour government actively promoted the PFI and PPP programmes (H.M. Treasury, 2000), as Gordon Brown stated in 1997: *'Through the PFI, the private sector is able to bring a wide range of managerial, commercial and creative skills to the provision of public services, offering potentially huge benefits for the government'* (Sussex, 2001:30).

Meanwhile, the new Labour Party claimed commercial know-how would be needed to meet social goals, in order to find a 'third way'. However, the major Labour Party policies on PFI eventually followed the same ideas to the Conservative party: the 'pro-market', 'pro-competition', 'efficiency-emphasis' (value-for-money) and improving relationships with private businesses. These were policies which were very different to the traditional values of the Labour Party (Shaw, 2004, Broadbent and Laughlin, 2004). An alternative interpretation was put forward by Shaw (2004) who stated that the Labour party claimed to use pragmatism in making public policies (what matters is what works), for solving the practical issues that the government faced. This resulted in a number of policies and ideologies of the previous Conservative government were kept by the new Labour government after 1997, e.g. the PFI and some fiscal policies.

The concept of 'Partnership' was also introduced by the Labour Government in 1999

(Treasury, 1999), leading to the creation of a new programme, known as the Public-Private Partnerships. In the period 1997-2000, another emphasis of PFI policy was on their VfM and the Treasury focused on how to introduce a practical method to evaluate VfM in PFI's appraisal, procurement and financing. Finally, the government offered quantitative guidance in detail in 1999 (known as Public Sector Comparators, PSCs), to judge the value for money for all PFI appraisals.

Since 1997 there has been 'an ever-expanding level of centralization and standardization in the development of thinking about PFIs' (Broadbent, *et. al.*, 2004). A number of initiatives were made by the Labour Government at the time. However, these were covered a few of areas:

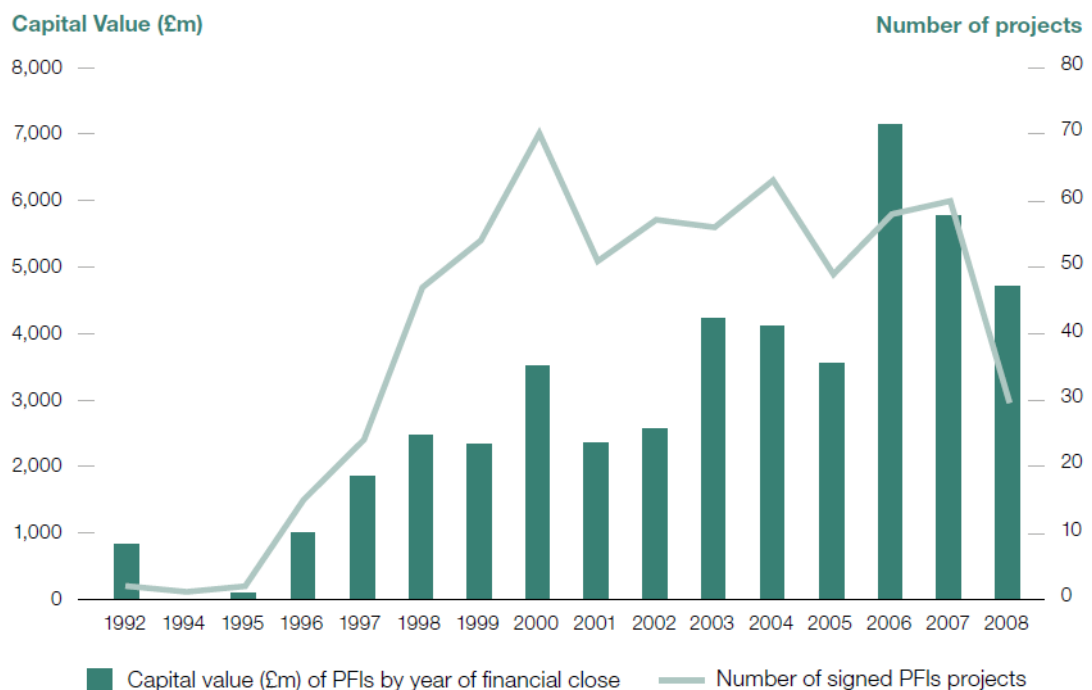
- the first focus of the government was to establish strategically the new institutions associated with the PFI and PPPs (e.g. the PFFT, PUK and OGC) to develop the detailed policies, frameworks and provide assistance on individual project development, with the experience of professionals from the private sectors.
- Secondly, the government practically paid more attention to formalizing the appraisal and procurement processes in the PFI transactions (e.g. a series of documents such as guides on 'how to conduct a public sector comparator' and 'step to step guidance to the PFI procurement process'). They also worked on standardizing contracts for implementing PFIs and PPPs (Standardisation of PFI Contracts Version I, in 1999).
- Thirdly, the government addressed some important arguments, such as accounting issues on the PFI (e.g. Technical Note 1, How to account for PFI transactions, in 1999) and the related employee arrangement in the NHS PFIs.

Following with creating a central PPP unit and the publishing of a range of technical notes and standardised PFI contract models, the PFI entered into its blooming stage in 2000.

3.3.3 The rapid expansion of PFI programmes in the UK: the Experiences and Lessons in the period of 2000-2008

In the period 2000-2008, PFIs entered what could be described as their ‘golden age’, 607 PFI and PPP contracts worth £57 billion capital value were signed by the departments of the central government and by local authorities. 424 of these projects had been built and were operational by 2009 (PUK database, 2010), as is shown in Figure 3.7 The Private Finance Projects development in the UK.

Figure 3.7 The Private Finance Projects development in the UK



Source: NAO, 2009a

In this period, the H.M. Treasury continually developed the main policies within the programme (Treasury, 2003, 2006, 2008) and resolved some implementation issues surrounding PFI, such as updating the standard contract model associated, the revision on the *Green Book* and the adjustment on the *Value for Money Tests* (Treasury, 2006). A series of policy and implementation guidelines were also developed and published by the Treasury since 2000. These covered a range of areas of PFI policy and implementation: e.g. the policies and documents for explaining and reviewing PFIs in the UK, and the PFI guides on how to provide value for money. In addition, the

associated PFI guidance on financial, technical and operational problems and improved standardized contracts for the PFIs were offered by the Treasury (see the table below, Table 3.8 UK PFI and PPP policy and guidance frameworks).

Table 3.8 UK PFI and PPP policy and guidance frameworks

Policies and Guidance	Name of Policy and Documents
<i>General policies and reviews</i>	<i>PPP: the Government approach, 2000</i> <i>PFI: Meeting the Investment Challenge, 2003</i> <i>PFI: strengthening long-term partnerships, 2006</i> <i>infrastructure procurement: delivering long-term value, 2008</i>
<i>Value for Money evaluations</i>	<i>Green Book</i> <i>VfM assessment and guidance</i>
<i>Technical guidance</i>	<i>Note 1: How to Account for PFI Transactions</i> <i>(Note 2: How to construct PSCs)</i> <i>Note 3: How to Appoint and Manage Advisers to PFI Projects</i> <i>Note 4: How to Appoint and Work with a Preferred Bidder</i> <i>(Note 5: competitive dialogue)</i> <i>Note 6: How to Manage the Delivery of Long Term PFI Contracts</i> <i>Note 7: How to Achieve Design Quality in PFI Projects</i>
<i>Financing guidance</i>	<i>Note1 : Interest and Inflation Risk</i> <i>Note2: the IRR uses in the PFI contract</i> <i>Note3: Preferred Bidder Debt Funding Competitions</i> <i>Note4: refinancing</i> <i>Note5: SPENS</i> <i>Note6: Credit guarantee finance</i>
<i>Operational policy and guidance</i>	<i>Note 1: benchmarking and market testing</i> <i>Note2: project transition guidance</i> <i>Note 3: Variations Protocol for Operational Projects</i> <i>Note 4: contract expiry</i>
<i>Contracts' standardsations</i>	<i>Continued...</i>

	<i>SoPC Version 4 and Guidance</i>
<i>PRG review criteria and procedures</i>	<p><i>Review on project's OBCs submitted by local authorities</i></p> <ul style="list-style-type: none"> <i>a) Affordability</i> <i>b) Design Quality</i> <i>c) Output Specification</i> <i>d) Risk Allocation</i> <i>e) Commercial Interest</i> <i>f) Compliance with Standard Form</i> <i>g) Value for Money Analysis</i> <i>h) Suitability of Advisors</i> <i>i) Indicative Timetable</i> <i>j) Project Team</i> <i>k) Commitment of Sponsors, Stakeholders, and Users</i> <i>l) Statutory Process</i>

Source: The websites of PPP unit, H.M. Treasury, accessed at 2009

During this increase in PFI's, some operational matters were explored at the time. The Treasury (2003a) reported that the overall performance of PFI projects was good, in terms of the construction time and budgets. At same time some problems were also revealed by the NAO (2009a), the Committee of Public Account (PAC) (2003) and academics (Edwards et. al, 2004), including, lack of competition, high bidding costs, long procurement times and a number of issues relating to the PSCs as an inaccurate appraisal tool. The Treasury (2003a) showed that implementation of PFIs in I.T. projects and the small-size PFI projects were problematic, due to the frequent changes in I.T. technology, the difficulties on specifying requirements by the public bodies and the high transaction costs incurred in the small projects. This meant that I.T. and individual small projects with capital value less than 20 million pounds may not be suitable for a PFI approach (Treasury, 2003a). In addition, the government decided to expand the PFI programme into other industries such as the waste, social housing and prisons. Furthermore, with increasing debates on the PSCs and the Green Book (H.M. Treasury,

2003b), the government revised them in 2003 and 2004 (the principal document of public investment appraisal).

In addition, since a large number of public projects have adopted PFI models, both of the governments and researchers also began to study the performance of the PFI projects and to examine if the implementation of PFI achieved the results the governments originally claimed and expected. These included including: the process and effects of procurement and tendering, the construction performances, the operational performances and if ‘value-for money’ (e.g. risks transfer) has been achieved in the various stages (Arthur Anderson & LSE enterprise, 2000, and the NAO, 2009a, 2010; IPPR, 2001; Mott Macdonald, 2002, ACCA, 2002, Pollitt, 2005, the PUK, 2006, 2008, Treasury, 2003a, 2006, 2008, Pollock et. al., 2007, UNISON, 2003, The Audit Commission, 2003, PAC, 2003, 2008, 2011, Edwards, et. al, 2004, UNISON, 2008a, 2008b, 2009, the Economic Affairs Committee , 2009). The findings of these studies are mixed, and inconclusive. Some of these studies and their arguments are shown in the in appendix 4.

Despite rapid growth, PFI projects accounted for only 10– 15% of local authority capital investment over the last five years (Committee on Economic Affairs, the House of Lord, 2009). However, PFI’s share of investment is clearly and notably higher in two industries than others: ‘... 70% of hospital schemes have been delivered by PFIs; and round about 60% of new schools have been delivered through the PFI route’ (Committee on Economic Affairs, the House of Lord, 2009, volume I, Para 19). It may be argued that the financing strategies of the government rely on the PFI approach too much, especially in the health and education sectors. In many cases, the public sector has no choice, but to use PFI. Before widely introducing and utilizing private finances to develop public infrastructure and services within all industries and sectors on a huge scale in the UK, the Labour Government was criticized for carrying out insufficient studies on the PFI programmes. However, they under-estimated the practical problems and costs and risks of the application of the PFI approach. The policies have been

continually refined over the last ten years under the Labour Government. By reviewing the history of the PFIs between 2000 and 2008, the government has largely improved the governance and regulatory frameworks of PFI through their centralization, institutionalization and standardization.

Meanwhile, the government has been aware of and studied the arguments and debates surrounding the programmes, and revised their regulations and policies. However, as the researchers argued (such as Shauol, 2005, Edwards, et. al. 2004), there are some unique problems associated with PFI that are not easy to solve by the government. Due to the large number of the PFI projects enforced to date, the costs of the lessons learned and errors corrected are too expensive and painful for the government. Some problems and mistakes could not be corrected, except by terminating a contract. Notable cases of this are IT PFI projects (NAO, 2001) and the London Underground PPP projects (NAO, 2004a, 2004b).

Since a large number of public projects adopted the PFI model and have been put into operation between 2000 and 2008, both the government and the researchers have paid more attention to studying and examining the applications and performances of these privately financed projects to see if they achieved the results the governments originally claimed and expected. The governments and some official-commissioned studies (HM Treasury, 2003, Macdonald, 2003, NAO, 2009, PUK, 2006) believed that PFI usually realized or potentially achieved their original claims. However, many studies presented the PFI as not performing as well as the government expected. There are still a number of issues associated with the programmes' planning, procurement, construction and contract.

3.4 The British PFIs in practice: the debates and lessons

3.4.1 The debates on PFI in the UK

The review of the history of PFIs in section 3.3, revealed that how British government had introduced new measures to improve PFI implementation in the recent years, such as the provision of standard contracts, the creation of support groups, the publishing of guidelines etc. However, despite these measures, problems still existed in a number of areas. Much of the criticism of PFIs focuses on their value for money, costs and affordability (Price et al. 1999; Ruane 2000, Ball et al. 2000; Akintoye et al. 2003; Shaoul, 2005), accounting and off-balance financing matters (NAO, 2009, Committee on Economic Affairs, 2009, Allen, 2003), transparency and measurement of PFIs (Pollitt, 2005, Pollock, et. al., 2009, Shaoul, 2005, Committee on Economic Affairs, the House of Lord, 2009), the risk transfer and allocations (Akintoye et al. 1998; Froud 2003; Bing et al. 2005, Edwards, 2009), lack of competition in the PFI procuring and tendering, the nature of contract, the contracting methods and the transaction costs (CIC, 2000, Froud, 2003, Heald, 2003, Edwards, et. al., 2004, PAC, 2001, Lonsdale, 2005, Flynn, 2007, Yescombe, 2007, Shaoul, et. al., 2008, Pollock and Rice, 2010, Committee on Economic Affairs, the House of Lord, 2009), finally, the PFI interaction with other policies (Ruane, 2002, Greenway et. al., 2004, Broadbent, et.al., 2003). The strategic and practical debates around PFIs in the UK have challenged all the fundamental ideas of the programmes at both the central and the individual project levels, including: the objectives of the programmes, the policies' formulations, the institutional arrangements, the scope of the programme, the procurement and tendering mechanisms, the contracting methods, the contract monitoring and evaluation systems and its wider effects on the public finances and social fields. Looking through the debates and arguments about the PFIs since their inception, some lessons can be learnt, particularly when the private sector is unable to finance PFI projects after a Financial Crisis like in 2008.

Based upon past experiences as well as the painful and expensive PFI failures, there are

a growing number of studies looking into the lessons learned from the implementation of the British PFIs, e.g. Spackman (2002), Pollitt (2005), Dixon *et. al.* (2005), the NAO (2008, 2009a, 2010), the PAC (2009, 2011) and the Economic Affairs Committee of the House of Lord (2009). This research showed that compared to conventionally financed procurement, PFIs brought both benefits and costs. However, *'the balance of advantages against drawbacks (of the PFI) was still unclear, and at the strategic level the main drivers still appeared to be ideology and accounting. However in its practical application many useful lessons had been drawn and applied'* (Spackman 2002:1). This section focuses on the debates about British PFIs and the lessons that were learned from the utilization of the programmes in the UK since their inception.

3.4.2 Is PFI a transparent and measurable policy?

The first strategic policy matter about the PFI addressed here is the transparency of information associated with the projects. Because both the supporters and opponents of the policies complained there were not sufficient data about how the PFI was implemented in the UK (Committee on Economic Affairs, the House of Lord, 2009, NAO, 2010, PAC, 2011). The PFI proposals, full business cases and contracts were never fully disclosed to the public. Even the most basic data showed that the number, size and real costs of PFI projects are difficult to know (Shaoul, 2005). Given the lack of data, it is difficult to prove whether the benefits of PFIs that the government promised were actually achieved in practices. Full evaluations and comprehensive measurements from the application of PFI projects was impossible within this context.

The low transparency of data from PFI contracts and projects' has led to obstacles in evaluating their real effects. It is difficult to gain details and performance of the contracts, from both the public bodies and the private contractors, due to the confidentiality of commercial contracts and information (Edwards, et al., 2004, Shaoul, 2005 and Pollock et.al., 2009). The applications of PFIs demonstrated that the quality of decision-making (value-for money tests) and evaluations of the programmes seemed to

have problems with regard to transparency.

At the same time, the results of PFIs could not be fully evaluated, since many outputs, benefits and costs of the programmes were difficult to quantify and not measurable within public infrastructure and services contexts. As Pollitt (2005) argued the PFI can only work if outputs and inputs specified in a contract can be measured accurately. However, the reality of the PFI approach is ‘...problematic for public services because they are often multi-dimensional and quality is difficult to assess. Thus the ‘output’ of a prison or hospital represents a measurement challenge. Similarly it is not easy to assess the quality of the asset created (as distinct from the service that it creates). For example, can the quality of a road be measured easily?’ (ibid:17-18)

The government may hope to use PFIs to clearly define performance requirements and outputs that in the future will contribute to better decision-making and project management, and be driven by value-for money in private financed projects (Arthur Anderson & LSE, 2000). ‘but this is not guaranteed, [because] PFI programmes introduce new challenges with respect to transparency, accountability and democratic legitimacy’(Koppenjan, 2008: 203). The real difficulties concerned with accurately defining outputs for projects led to obstacles when making decisions about PFI and measuring their implementation. As the NAO (2009a:19) argued that ‘using private finance brings benefits, but these cannot be counted on...’. This is due to the many costs and benefits that have been incurred by the PFI projects that could not be quantified and valued, or that were considered in the PFI evaluations (Coulson, 2005). Therefore, many previous studies could only emphasis specific aspects and address the common lessons and failures that could be learnt.

3.4.3 Is PFI mobilising private investments and off-balance sheet financing?

The official statistics of the Treasury (2010) and the PUK (2010) indicated that a large amount of the private investment (£72 billion) had been used to develop the public infrastructure and services in the UK to date. The short-term economic effects of the PFI are clear as the government were able to raise the investment capital in a short

period of time. But, it was argued that the government may use PFIs as a ‘mega credit card’ and as a financing tool to ‘buy now, pay later’. The PFI seemed to bring in the private capital the government urgently needed, while the policies also created a huge amount of debts or liabilities for the government in the future (Economic Affairs Committee, 2009).

A number of researchers (Chesson and Maitland-Smith, the ONS, 2006) believe that the government in the UK prefers PFIs because most of them have not been included on the public authorities’ balance sheets. The majority of private finance projects have previously been off-balance sheet and not recorded in Government statistics of the Public Sector Net Debt. The NAO (2009:36) indicated that 78% (£22 billion) of operational PFIs in England by capital value are not recorded on the balance sheet of the public sector financial accounts, and 95% of local PFI projects by capital value were also off-balance sheet.

The Treasury claimed accounting treatment should not drive decisions to use private finance (Treasury, 2003:10). However, the criticisms still raised questions about accounting because PFIs were off-balance sheet financed, and they offered substantial impacts on the overall economic and financial situations for the government. PFIs when excluded from the public accounts, will give a misleading picture of overall liabilities of the country (Economic Affairs Committee, 2009). The real barrier to bringing the PFIs into the national accounts and public sector net debts is the government’s fiscal rules, especially under the Labour government (1997-2010). They insisted that the total public debts should be maintained at under 40% of the GDP. Therefore, in practice, some departmental guidance for local projects has historically emphasized the need to specify projects so they would be off-the balance sheets. ‘Numerous project and programme managers have told us that keeping debt off-balance sheet was a driver behind their projects’ use of private finance’ (NAO, 2009a: 8). Meanwhile, this made funding and budget mechanisms for on-balance sheet projects less attractive, due to the pressures of maintaining control of public spending. This suggested that the PFI could be made to

‘work’ only through ignoring IFRS (Ruane, 2002). Institutional bias in favour of private financing of public procurement was created in the public sector and was observed in many sectors, specifically in hospitals and schools (Ruane, 2000, Economic Affairs Committee, 2009).

It is notable that central government departments were required to issue accounts using IFRS (International Financial Reporting Standards) in 2009. Under IFRS, the British PFIs which are substantially controlled by the public sector should be brought on to the departments’ balance sheets. This differs from the UK GAAP (Heald, 2009). These changes in public sector accounting standards caused conflict between the department accounts which adopted IFRS and the National Accounts which adopted UK accounting standards. In order to solve this conflict, the Treasury put forward a compromise solution that required the departments to produce a second set of accounts in line with the old UK GAAP which would be consistent with the National Accounts. Consequently, the NAO (2009) demonstrated that the majority [of PFIs] would still not be included in the statistics of the Public Sector Net Debt.

Finally, as suggested by the Economic Affairs Committee’s report (2009), there should be greater clarity about financial liabilities arising from PFIs. The government may use PFIs as a ‘credit card’. However, at least, ‘brief statistical information should also be supplied as to the distribution of these liabilities across a series of separate categories. This should reflect the differences in the extent of risk transfer away from the public sector’ (Economic Affairs Committee, 2009:18). Otherwise there would be a danger that the governments would lose control of their public financial management.

The NAO’s (2010) recent findings stated that, in late 2007, market confidence in the providers of this form of credit insurance collapsed, leaving PFI projects in the United Kingdom without access to the capital markets. As a result, a number of the PFI projects were delayed and had to be finalized by the government and private contractors. Furthermore, following the continued Financial Crisis in 2008, the debt finances of PFI were not readily available and were strictly accessed. Finally, the Treasury had to build

the Infrastructure Finance Unit in 2009 to help private contractors finalise and enforce the PFI contracts by providing ‘public finances’. The worst case is the Metronet’s failure, according to the NAO (2010), due to a number of mistakes in contract design and management. Eventually, the government has to cover 95% of the billions lost in the project value.

3.4.4. Value-for money: the myth of the British PFI?

The Labour government (Treasury, 2003a, 2009a) claimed that the ultimate objective of the PFIs was to achieve value-for money. Although the concept of value for money was first used as a management tool by the government of New Zealand (De Lamos *et. al.*, 2003), Britain may be the first country in the world to require their PFI programmes and projects to demonstrate value-for money. This was very different element that from BOT and other forms of PPP models in the developing countries, such as China. Therefore, a number of studies and research (Qin and Yu, 2005, Leigland and Shugart, 2006) were interested in this concept and its real implementation in the UK. While it can be seen that the majority of debates surround value-for money by looking at past studies in the UK, a large amount of the research and reporting done on this concept and its application, included asking some key questions: e.g. what is value for money? How do the British PFIs ensure value for money can be achieved and by what means, and under what conditions? Whether value for money was achieved in the British PFIs?

First of all, it can be seen that ‘value for money’ is an absolute concept (as a performance audit), as the Treasury claimed that ‘*The central proposition should always be that PFIs should only be pursued where they deliver value for money (VfM), and where VfM is the optimum combination of whole life cost and quality (or fitness for purpose) to meet the user’s requirement...*’ (H.M. Treasury, 2004: 3). It required that private contractors deliver the services and outputs that had been clearly defined in the PFI contracts, in terms of costs, time, qualities and quantities. The government was aware of the importance of these clear outputs and other requirements for the PFI

projects. A list of favourable preconditions were set out when the PFI option was considered, because the Treasury required that the proposed PFI projects should have clear boundaries and measurable output performance (Treasury, 1997). The structure of the service should be appropriate, allowing the public sector to define its needs. Service outputs can be adequately contracted for in a way that ensures effective and accountable delivery of public services into the long-term, and where risk allocation between public and private sectors can be clearly made and enforced (Treasury, 2004, 2006b). Although this intention of the government is good, the practice of PFIs made it difficult to realise in practice, given the measurement challenges on specified outputs within public infrastructure and services (Pollitt, 2005).

At the same time, value for money is also a relative concept in the British PFI (as a benchmark or comparative tool of management accounting). The NAO stated: *'It also requires demonstrating, as a relative concept that better value for money is being achieved than through other forms of procurement. That comparison depends on identifying a counter-factual or comparator project'* (NAO, 2009a: 9).

The analysis on the PFI's framework and procedures showed that the implementation of the PFI heavily relied on the comparisons with conventional procurement in the public sector (PSCs or quantitative tests in value for money tests). It is a good idea in principle to compare and clarify the costs, risks and benefits of private finance projects with that of the public funded cases (PSC). However, the major flaw of the PSC is that it is too heavily dependent on hypothetical, risk-adjusted costs (Ruane, 2004).

PSCs have undergone considerable debate concerning their reliability, accuracy, complexity and relevance in the contexts in which they have come to be used (Coulson, 2005; Shauol, *et al.*, 2005, NAO, 2009a): Firstly, the PSC's calculations on costs are not accurate, it is impossible to precisely estimate all costs (whole life costs) of running a project over a thirty year period. Secondly, identifying and valuing the risks that could happen in the next thirty years is not feasible and will be discussed in the next section. Thirdly, there are wide arguments about the discount rate used in the PSC calculations

(Pollock, et. al, 2007, Sussex, 2001). Fourthly, the results and costs of the PSC can be manipulated and adjusted subjectively (PAC, 2003). PFI deals can always be ‘cheaper’ (PAC, 2003, 2009). Finally, the uses of PSCs are expensive and time consuming, but not easy to understand, as the Audit Commission (2003) found in many school PFI cases. Given much data was not available, the low-transparency of the contractual information and arrangements and the subjective error-ridden financial modelling in the quantitative tests, the government found it difficult to achieve the precise value for money judgements. A little mistake may lead to a wrong decisions by the authorities. It was argued there are a number of flaws and matters (e.g. discount rates and the costs of risks transfer in PFI proposal’s evaluations) that would impact on the fairness and accuracy of the value-for money tests in practice (Sussex, 2001, Broadbent *et. al*, 2004).

The Treasury inserted qualitative tests in the value for money assessments based on previous lessons, trying to improve the decision-making processes in their PFI’s appraisal (H.M. Treasury, 2003b, 2006b). However, this still cannot fundamentally change the drawbacks of the value for money tests that are currently applied in the UK. Factors that make the value for money tests in the PFI programme lose relevance with real practices include: the institutional bias on the conventional procurement methods, a number of costs and benefits in PFI, and non-PPP procurement that cannot be quantified, and the problematic and complex financial models.

Bult-spiering and Dewulf (2008) argued that value-for money is politically easy to sell but hard to quantify. Even the advocates of PFIs worldwide, the PPIAF (Leigland and Shugart, 2006) are not suggesting that developing countries copy the value for money assessments and PSC’ practice of British PFIs, instead of addressing the ideas and principles. Therefore, it can be seen the ideas of value for money and PSCs are good, but the problem is how to put them into practice and reach the right decisions.

Official studies and evaluations produced by the Treasury (H.M. Treasury, 2003, PUK, 2006, 4Ps, 2008) have always claimed that value-for money has been widely achieved in the majority of PFI projects in the past. However, negative experiences and evidence

were still found in a number of studies (Gaffney and Pollock 1999; Price *et al.* 1999; Ruane 2000, Ball *et al.* 2000; Akintoye *et al.* 2003; Shaoul, 2005). Even, the NAO (2009a: 20) reported that about 20% of the projects they had examined had clearly failed to achieve VfM, normally due to poor tendering or contract management.

Finally, if value for money could be achieved in the PFI, it largely relied on other factors and arrangements of the programme and project: such as the risks transfer and allocations, contracts management and monitoring, the competition in the tendering phase and the capabilities of the public and private stakeholders. These are discussed in later sections in more detail.

3.4.5. PFI and the Risks Transferred

Since the first PFI was instigated in 1992, one of the important claims of the government is that PFIs should transfer risks from the public sector to the private contractors. The Private Finance Panel (1995a) commented that a PFI has to meet only two requirements to be approved: the public sector needs to secure value for money and also transfer the appropriate risks to the private sector. Many researchers and the government identified that value for money and risk transfers are interconnected. ‘Risk transfer has been considered the linchpin of value for money in PFI schemes and it is a key criterion in testing value for money’ (Gao and Handley-Schachler, 2003: 28). As discussed in section 3.1, under British PFI arrangements, private contractors are usually responsible for project’ design, construction, finance and operation, so the government claimed many risks had been transferred from the public sector to the private sector.

However, in practice there are some obstacles to transferring risks in a PFI. The first problem is to identify and quantify the risks relevant to the PFI project. The private Finance Panel (1995) identified six principal risks associated with PFI projects in 1995. However, later studies conducted by Gaillimore *et al.* (1997), Akintoy *et al.* (1998), Akintoy *et al.* (2003) and Bing *et al.* (2005) demonstrated that many more risks were

involved in PFI projects following the programme's wider implementation in the UK. Gaillimore *et. al.* (1997) investigated and classified ten risks in PFI projects, Akintoye *et. al.* (1998) found twenty-six principal risks that had been observed and reviewed in a PFI's planning, procurement and operation; and Bing *et. al.* (2005) listed forty-six risks in the private finance projects from macro to project levels. Earlier studies on the risks associated with PFI projects showed that both the public client and the private sector had limited knowledge and understanding of risk allocation and management, and for the public procurement bodies, such commercial skills were generally weak across all central departments (PAC, 2009, NAO, 2009). Although the Treasury had issued guidance on such topics in the Green Book (Treasury, 2003 b) and other departmental documents. There were also risk management and evaluation tools based on the guidelines (H.M. Treasury, 2006b) from the government. Despite there are still some risks that were not easily identified, allocated and priced by the public client and private contractor, and problems arose. Evidence from the transport industry showed that both the public procurement authorities and the private contractors had difficulty accurately examining and predicting the major risks in long-term projects (Shaoul, *et. al.*, 2006, Edwards, *et.al.*, 2004, NAO, 2006). In the Channel Tunnel PPP project, the demands and revenue of the project was overestimated and, the actual passenger numbers were only about one third of what was forecast (NAO, 2006). In some shadow toll road PFI projects, the demand risks were underestimated, public authorities needed to raise a large amount of money from the private sector (Edwards, *et. al.*, 2004). At the same time, due to the fact that most risks should be identified and allocated in the procurement and negotiations phase before the PFI contracts were finalized, both the public and private sector may not have enough data and information about the risks they faced in the lifetime of the contract. It is extremely difficult to predict and quantify the value of risks over a thirty year period (incomplete contract matter). Akintoye *et. al.* (1998) found that some private contractors had debated that 30 year (PFI) contracts are not workable and that, there were too many risks that cannot be predicted, identified and

valued in advance. These included predicting interest rates over a period which is not feasible but it is directly related to the contractors' financing risks.

The second issue is the allocation of the risks. The government claimed that not all risks can be transferred to the private contractors under the PFI contract. Instead, PFIs aim to allocate risks to the parties best able to manage them. As preconditions for applying a PFI and achieving value for money, the government required 'risk transfer to the service provider to be commercial in nature and controllable' (Spackman, 2002), '...risk allocation between public and private sectors should be clearly made and enforced, ...risks are capable of being costed on a whole-of-life, long-term basis' (Treasury, 2006b: 6). Bing *et. al.* (2005) reviewed the risks mentioned in previous reports about PFIs, suggesting that the allocation of the risks in a PFI is not an easy task. The study (Bing *et. al.* 2005) revealed there are still a number of risks that cannot be clarified and allocated between the public and private parties of the contract, it considered case by case, for instances, the risks associated with level of public support, project approval and permits, contract variation and lack of experience. Debates surrounding risk transfer and allocation are also explored by other researchers, Froud and Shaoul (2001: 252) argued how much risk should be transferred (to the private contractor in the PFI) is a matter of some 'ambiguity', even when very little risk has been transferred and/or 'a very narrow concept of risk' has been defined.

Moreover, as Akintoye *et. al.* (1998) found the public sector client may overestimate the willingness and capabilities of the private sector on sharing the related risks of a PFI project. The findings (ibid, 1998) suggested that the private sector are also averse to risk, and try to minimize as much as possible in the PFI project. They are only able and willing to manage (and value) the risks under their control. There are many risks that lie outside the control of the contractors, and are not transferable. The authors found private contractors only focus on the risks that threaten their profit levels (e.g. design risks, construction costs, cost overrun risks), while the client may pay more attention to those risks which threatened the timing, availabilities and performance of the asset

and the commissioning risks. In other words, the public client and private contractors have different incentives and interests on sharing the risks in the PFI. Therefore, risk allocations are often not clear and can become a point of controversy between the two parties in the PFI contract.

Which risks have been genuinely transferable in current PFI projects and which have not? A recent study (Economic Affairs Committee, 2009) demonstrated that the construction and maintenance risks are usually seen as suitable for transfer to the private sector, whereas activities over which the private contractor is seen as having little or no influence have not. This is because the private sector is usually better placed to manage construction risk (to secure their profits), such as building on time and on-budget and the risks involved in providing maintenance over the asset's lifetime. In addition, Coulson (2005) argued that if the government only wanted to deal with the risks associated with the project's cost overrun and construction delays, then a short-term 'fixed price contract' should be chosen, rather than a long-term costly PFI contract.

The report and evidence from the Committee on Economic Affairs, the House of Lords (2009) also noted that besides construction and maintenance, it is unclear what other risks the public sector seeks to transfer and to what extent. The study indicated that some important risks are still retained by the public sector clients. It is significant in a number of road, transport, hospital and school cases, that the public procurement authorities usually retain major risks related to demands (Economic Affairs Committee, the House of Lord, 2009, volume II: 281). As explored by some studies (Edwards, *et. al.*, 2004, Flynn, 2007, NAO, 2009b), the ultimate and major risks in PFIs were kept in the public sector in many cases, given that annual payments and unitary charges were guaranteed by the public procurement bodies. Meanwhile the public clients of PFI contracts were not always fully aware of the issues until the whole PFI project had become inoperable, such as the London Underground PPPs, the Metronet collapse, the Benefits Payment Card Project, National Insurance Recording System (NIRS2) etc.

Pollock and Price (2008) debated that the evaluations on the relationship between risk

transfer and risk premium in PFI contracts was not well conducted during post-contract phases by the public sector. In principle, if private contractors assumed more risks, they would get higher returns (risk premium). However, Edwards, *et. al.*, (2004) and Shaoul *et. al.* (2005) found that the public sector paid too much premium to the PFI contractors for just transferring construction and cost overrun risks in road projects. By reviewing the reports of the NAO in the last few decades, the post-contract risks management and evaluation were only addressed in the financial inquiring into ten projects (Pollock and Price, 2008). Even with these ten cases, only three of them examined the relationship between risk transfer and risk premium. The government, including central governmental departments and the auditing bodies have no clear data and information on what risks have been transferred to what extent and in what ways in PFI projects. This is due to the absence of proper and accurate risk evaluation and control in PFI operational phases. A recent study on risk transfer and management in defence PFI projects was undertaken by the NAO (2008) endorsing the conclusions of Pollock and Rice (2008): underdeveloped robust systems to monitor and manage ongoing risks were found in five of eight projects with the government having insufficient means and tools to identify and measure what risks were transferred and to what extent.

NAO (2009a, 2008) also commented that risk allocation and management are not easy tasks, and will often involve a number of techniques including financial analysis, negotiation and the following of best practice and guidance (see the guidance of the H.M. Treasury). The NAO (2009a) believed that delivery of real risk transfer depends on a good contract. It suggested (NAO, 2008), that both the public clients and the private contractors needed to follow the Treasury's Standardisation of PFI contracts (SoPC) Version 4 which was the latest version of the standard wording and guidance to be used by public sector bodies and their advisers when drafting PFI contracts. However, due to the incompleteness and the long maturity of the PFI contract, effectiveness on allocating and controlling risks is in doubts. Another problem is that real PFI contracts were rarely open to the public due to commercial confidentiality. Academics and

researchers cannot access these documents at all, which seriously restricts the information available relating to risk identification, valuation and transfer. Finally, the public client does not pay enough attention to new risks that may be created by the use of PFI, such as ‘opportunistic behaviour of the private contractors’ and ‘the lock-in effects’ of the long term contract’. This will be discussed in the next section. The NAO (2009a: 54) admitted ‘there is no simple checklist of things to do to manage such commercial risks (introduced by PFI contracts)’.

3.4.6. The British PFI as a contracting method: the lessons from the UK

There are a number of the strategic and theoretical issues surrounding the implementation and management of PFIs in terms of contract design, negotiations, management and monitoring. The first question is why and when a PFI contract could be used? In other words, why not use conventional procurement in a similar situation? If the PFI is no better (value for money) than the conventional procurement, why would the government use a PFI? Therefore, the value-for money tests were introduced into the PFIs’ appraisal and evaluation to judge if the PFI is better than the public procurement approach. The flaws and drawbacks of the value for money tests and PSCs have been discussed in previous sections. However, putting these arguments aside, there are still several matters related to the contracting PFI that need discussion.

3.4.6.1 PFI is an expensive contracting method to develop public infrastructure and services in the UK: the considerations on the transactions costs and other extra cost

As the theory of the Transaction Cost Economics (Williamson, 1996) indicates contracting is a complicated method, which needs to be concerned with the transaction costs incurred by the preparation, tendering, bidding, and negotiating, enforcing, monitoring and evaluating processes. In the cases of British PFIs, these costs were presented as consulting fees for legal, financial and technical advisors by both the public and private sectors. They include the extra financing and interests costs of private

finances, the insurance charges related to the PFI projects, costs of enforcing and monitoring the contractual promises, and the costs associated with breaches of contractual arrangements etc. If these transaction costs associated with the PFI projects are much higher than the benefits brought in by the PFI, the project will not be worth the expense.

The reviews of Economic Affairs Committee, the House of Lords (2009, Volume II) showed that the average transaction cost (the financing costs, consulting and negotiating costs etc.) in a British PFI project is around 8%-10% of the contract defined as capital value (similar with the findings of Edwards *et. al.*, 2004). This is much higher than that for a conventional public funded project. Given the high transaction costs in the PFI approach, 'value for money' can only be achieved by reducing costs of similar services, or providing an improved service at the same cost, or a combination of both. Therefore, one key question is whether or not the extra costs associated with private finance in a PFI have been offset by the improvements in performance of production. In this respect, the existing evidence is inconclusive, unclear and very controversial in some cases. The Audit Commission (2003) reviewed cases from school PFIs and non-PPP projects. They found there was not much difference between privately financed and conventional public funded projects, in terms of construction time, quality and design. However, PFI projects may be more complicated and expensive. Based on the British road PFI projects' studies, Edwards, *et. al.*(2004) argued that the relevant transaction costs of the PFI are much higher, although some risks in the construction phase have been transferred to private contractors. The authors also questioned if it was worth paying too much risk premium to private contractors just for transferring construction risks. Shaoul *et. al.* (2008), Pollock and Rice (2010) and BBC (2007) also argued that the high interest costs and huge long term debts of PFI hospitals caused financial difficulties and budget inflexibilities for the public authorities. In the cases of Norfolk and Norwich Hospital PFI, Edinburgh Royal Infirmary PFI and University of Coventry Hospital PFI, the costs of the PFI were much higher than conventional routes. The Treasury (2003a)

also discouraged small projects with a capital value of less than £20 million for adopting the PFI approach, due to the high transaction costs (Treasury, 2003a). Therefore, researchers questioned if PFIs are too expensive to adopt. In addition, the high transaction costs in the PFI projects may make an impact on other perspectives of PFI procurement, for example, the high bidding and negotiating costs with the public sector may scare away potential bidders. This could lead to weak competitions amongst a smaller number of companies that are able to afford these costs (PAC, 2003).

3.4.6.2 The incompleteness of British PFIs contracts

The secondary problem with the PFI contract is the incompleteness of the contract itself. From both a theoretical and practical perspective, the effectiveness of the PFI contract was limited when it was applied to managing public services or infrastructure development, because of the incomplete contract and such a long timescale included (Flynn, 2007). The central and theoretical debate is that neither side in the PFI contract are able to make complete optimal decisions for the contract's negotiation and design, due to a lack of information. It is also impossible for them to take account of all the information available in some areas during the decision process (Milgrom and Roberts, 1992). As the Transaction Cost Economics (Ménard and Shirley eds., 2005) suggested: PFI differs from 'spot' contract (cash and carry contract) or short-term contracts, because the duration of a PFI contract is long and the future is difficult to predict, it becomes absolutely impossible to create a complete contract and very costly to achieve coverage of all foreseen contingences. The PFI contract generally lasts about thirty years, but is impossible for both parties to define all possible events or contingencies and risks for this period. In fact, a number of studies addressed the issues of the incomplete contract for the British PFI at an earlier stage. The Construction Industry Council (2000) noted, 'Because PFI contracts are of such long duration, they must necessarily be incomplete, to the degree to which we cannot draw up, in advances, a complete set of clauses dealing with every set of circumstances that might arise. Even if we could, it would be very costly to do so' (CIC, 2000: 18). The Treasury (2006), and

that the PAC (2008), NAO (2008) and Shaoul et. al., (2008) also noticed the incompleteness of the PFI contracts, the way of the government was to standardise and made contract 'relatively complete', depending on the lessons and experiences learnt in previous PFIs. In the last ten years, three big adjustments to the PFI Standardized Contracts (SoPC) models have been made by the Treasury. Some lessons and detailed explanations on the specific clauses were introduced into the new versions of the model contract. The numbers of pages of the SoPC increased from under 100 in its first version in 1999, to 349 pages in the fourth version in 2007. The improvements of the SoPC in the last ten years indicated the incompleteness of PFI contracts. However, many resulting events and contingencies may still not be realized by both the public and private sector.

3.4.6.3 PFI contract: introducing new risks for public projects

The success of the PFI projects largely depends on the design, content and quality of the contract. In a British PFI contract, the risk allocations, the specific requirements and outputs, and the payment and pricing mechanisms were written into the contract. The three purposes of the PFI contract as claimed by the H.M. Treasury (2007) were: '*First, to promote a common understanding of the main risks which are encountered in a standard PFI project; secondly, to allow consistency of approach and pricing across a range of similar projects; and thirdly, to reduce the time and costs of negotiation by enabling all parties concerned to agree a range of areas that can follow a standard approach without extended negotiations*' (H.M Treasury, SoPC 4, 2007:1). However, as mentioned in the last section, since the PFI contract almost by definition will be incomplete, not all risks and outputs were essentially and clearly inclusive and written into the PFI agreements. Therefore, when the PFI was adopted, it was argued that new risks relating to the contract may be inevitably introduced at same time (Froud and Shaoul, 2001).

The first risk is the opportunism within both parties of the PFI contract. Opportunism

refers to 'the incomplete or distorted disclosure of information, especially with calculated efforts to mislead, distort, disguise, obfuscate or otherwise confuse' (Williamson, 1985: 47). Both parties in the contract may keep their own 'information private' and this leads to 'information asymmetry', 'adverse selection', and 'moral hazard'. Self-interested mis-behaviour is made possible by both parties' lack of certain knowledge (Williamson, 1985). The incompleteness and long maturity of a PFI contract and the information asymmetry between the client and contractors, could finally result in private contractors' using opportunistic behaviour in the implementation of the contract at both pre and post-contractual stages. Examples of this opportunism include raising charges, reducing the quality of the service provision, cutting down on maintenance, and avoiding investments in uneconomic project components (Koppenjam, 2008). In fact, the principal-agent theory also examined opportunism in the contracting process. The theory suggested that it is difficult to measure the performances of the agent (the PFI contractor), since the day-to-day management information is not known by the public clients. The incomplete contracts, flawed clauses and transfer over of staff who used to work for public agents, make it almost impossible to clearly regulate and monitor PFI contractors' performances and operations. PFI contractors may only focus on their interests and behave opportunistically, to get a higher return on their investments. The NAO (2009) and the Committee of Public Account (2009) found that the PFI project managers and public clients did not usually test the ongoing services delivered by the private suppliers under PFI arrangements and that performance measurements were actually absent in some cases. As Lansdale (2005: 73) commented 'Opportunistic suppliers are always looking for circumstances that will allow them to generate higher returns from a relationship. In the PFI context, the higher returns could come from the passing back of risk. The scope for suppliers to do this will be increased if the governments have been unable to sign complete contracts.'

The second risk of contracting is where the public sector are 'locked-in' to the PFI agreement with the private sector, due to the long maturity and inflexibility of the PFI

contract. As Lonsdale (2005:70) argued ‘In many PFI projects, the public body becomes asymmetrically locked-in to the private sector provider extremely quickly – sometimes even before the contract is signed – and is in no position to enforce the risk transfer arrangement. A situation of asymmetric lock-in exists where one party is locked-in to a relationship to a much greater extent than the other party.’ As the author commented further (ibid, 2005), although the ‘lock-in’ may often happen in conventional projects too, the long maturity of a PFI contract makes this problem worse. Since almost all of the British PFIs are guaranteed and paid for by the public procuring bodies through annual payments and unitary charges that were defined in the contracts. Heald (2003) revealed that the public sector was actually locked into long-term payments for services which may later not be needed. The University Hospital of Coventry PFI is a typical case of this. Froud’s (2003: 582) also commented that ‘. . . the PFI contract reduced the ability of the public sector to deal with uncertainty, by locking the state into contracts typically over 20 or 30 years (or longer) and reducing the flexibility to respond to a dynamic environment’. NAO (2009) noticed it is inevitable that changes will be required during the life of a private finance contract. However, making changes requires negotiation to change the contractual specification. Contractors often use such negotiations as a way of enhancing their profitability which leads to further risk for the government in PFI contracts.

The third challenge for using the PFI contracting model is hold-up issues. In PFI projects, if the government has made asset-specific investments with private suppliers, then an asymmetrical dependence relationship develops, making it difficult to allow the public sector to change the contract conditions to its advantage after the contract is signed. Even supporters of the PFI (Pollitt, 2000, p19) revealed that it would be expensive to break PFI contracts even if they were proved to not be meeting social needs. It may also be difficult and expensive to renegotiate service delivery terms. Therefore, under PFI arrangements, both the private sector and the government face potential hold up problems where one party can take advantage of the changing

circumstances to increase the cost to the other party if situations arise which was not specified carefully in the original contract. The NAO (2009a) reported that most private sector PFI partners charged an additional management fee of 5-10 per cent for changes (of the contract clauses or specific requirements) which was not justified by the work needed to process them. Even, smaller changes were relatively expensive and took longer to process than in non-PFI projects.

In addition, private parties can threaten bankruptcy or actively aim for it. Since the government ultimately has an interest in a completed project which will be operated properly, it will feel compelled to intervene in order to save the project. The course of events regarding the bankruptcy of the Channel Tunnel Rail Link in the UK is an example of this (Lonsdale, 2005). Both the government of the UK and France had to provide financial aid to complete the projects.

3.4.6.4 The cooperation between government and the private sector within PFI contracts

From Transaction Costs Economics' perspectives (Williamson, 1985, 1996) suggested that the government should establish 'relational contracts' with private partners. In PFI cases, the UK's government claimed (Treasury, 2006) it would build and 'strengthen long term partnerships in their PFIs with the private sector, these attempts can be deemed as the authorities' trying to build a 'long term' relational contract but with an 'incomplete contract'. The public sector expected to build a 'relational contract' to achieve 'value for money', risk transfer, innovation and effective management skills from the private sector in the long term, say 25-30 years for a PFI contract rather than develop 'an adversarial relationship'.

However, there is no simple solution for building such a relationship in practice. In many failed PFI projects in the UK, opportunistic behaviour at ex-ante and ex-post contracting phases were found (a form of adversarial relationship) (Ruane, 2002). The NAO (2009a: 55) explained this phenomenon as: 'A traditional customer-supplier relationship (in the PFI) which often leads to decision-making which is not focused on

the business as a whole. This type of behaviour can lead to missed opportunities to achieve wider objectives'. The 4Ps (2005) claimed that the good relationships have been widely formed in a number of cases they observed. However, as the NAO (2009a) found that in many PFIs, the relationships between the authorities and private contractors were just 'us and them' rather than relational contracting built on 'trust' and 'cooperation' for the long term. The NAO (ibid, 2009a) and the 4Ps (2005) also believed that the right contractual framework and working culture, and alignment incentives of client and contractors are important for partnership working. However, these conditions are still absent in many cases. Yescombe (2007) argued the difficulty in forming a good partnership between the public sector and the private contractor in a PFIs is the mismatched 'interests', expectations and incentives. Under the PFI framework, the private sector's interests are always to get their payments and make profits with minimum risks, through fulfilling contract required 'out-put' rather than achieving 'value for money'. It is difficult to form such close relationships between public and private sectors under PFI framework.

3.4.6.5 Managing and monitoring the PFI contracts

The NAO (2009: 2) argued that public authorities need to improve management of contracts, because there exists: 'A culture of focus on making the deal rather than thinking about contract management is still, prevalent in many quarters of the public sector'. This is especially true for public procurement authorities that need to ensure that they get the quality of assets and services that they specified in the PFI contract. Differing from the price regulations of the fully privatized industries in the UK, the British PFI is regulated by the contract in principle. In theory, PFI contracts are essentially a performance management 'checklist' where the contractors report their own performance against the set of performance indicators specified. Monitoring and managing the performances of the PFI are important means and incentives to drive the suppliers and contractors to perform well. The authorities need to make payments or

charge penalties to private contractors based on their performance, claimed the government (Robinson and Scott, 2009). The PFI contract should make financial incentives to encourage suppliers to improve performance in theory. The suppliers surveyed also agreed that incentives did encourage them to perform (PAC, 2009). However, the Committee of Public Accounts (The PAC, 2009: 5) found that central government does not pay sufficient attention to contract management. The committee suggested the government needs to ensure that service levels and value for money are maintained over the duration of the contract. As PAC (ibid, 2009) reviewed, in most cases, central government regularly collects performance information and discusses performance with suppliers, but key performance indicators are not always updated to keep pace with the changing business requirements. The NAO (2009) added that project managers in PFI projects were not always reporting the faults and under-performance information, thereby very few penalties were applied to contractors. Public clients do not always enforce the contract and sometimes they fear that applying penalties will harm their relationship with the contractors and cause further performance issues. The Office of Government Commerce (OGC) also admitted that there would also have been instances where penalties had not been applied but should have been (PAC, 2009). Furthermore, by reviewing the performance and management of hospital PFI contracts, the evidence of NAO (2010) showed nine of the 76 PFI contracts (12%) had no one assigned to contract management. The effectiveness of PFI contracts monitoring and management also suffered from this transparency and availability of associated data from both the PFI and non-PFI projects. As a part of value-for money tests in a PFI, public authorities need to conduct 'market tests' or benchmarking at post-contractual stages. This is crucial for PFI service pricing and measurement. However, in hospital PFIs it becomes impossible because the NHS stopped collecting relevant data in 2008. Robinson and Scott (2008: 181) questioned the complexity of the performance measurements and the inadequate resources for performance monitoring. The difficulties in the interpretation of the output specification raised questions as to

whether the low level of deductions truly reflected the actual level of services delivered by the PFI contracts. Given this evidence, if the government and public clients do not enforce the contract and monitor the performance of the private contractor carefully, the PFI contract would be pointless and the value for money will be at risk.

In fact, the poor evaluations and performance measurements of PFI contracts at the post-implementation stages had been argued by the PAC (2001). Their main questions about the post-contract management of a PFI included:

- Has value for money been declined after the contract-letting?
- Has benchmarking been done properly?
- Did the private contractors get an extra high rate of return from the PFI projects?
- Are there any risks that have been transferred or not to private contractors?

In 2001, the PAC had already suggested the government department should pay attention on these issues. However, later studies (NAO, 2009, Committee on Economic Affairs, the House of Lords, 2009, PAC, 2009) found the problems are still there without significant improvements.

3.4.6.6 Lack of expertise, experiences and skills in the public sector in operational phase

As the NAO (2009a) showed, a large number of technical, legal and commercial advisors were brought in to the contract tendering, negotiating and finalizing stages, to ensure that the contract is based on the right commercial terms, and negotiating properly carried out. However, after the contract-letting, the majority of the expertise and advisors were withdrawn and only a small portion of the expertise (less than a quarter) stayed to manage and monitor the contract (PAC, 2001). ‘A lack of staff continuity from the tendering to the contract management stages made it harder to achieve a high standard of contract management, and caused loss of technical and commercial knowledge. A change in staff made it harder to establish effective relationships between the public authority and the contractors’ NAO (2009a: 59). By reviewing privately

financed projects since 1997, the PAC (2009) found that the procurement authorities often underestimate the amount of resources needed for contract management. Some public authorities do not employ a full-time contract manager, leaving key risks unmonitored and unmanaged. There is a shortage of commercial and project management skills needed to manage private finance and other major complex projects across government. There is insufficient training for contract managers across government, and also limited career structures.

In addition, NAO (2009a) found that public authorities often over rely on external advisors to fill this gap in the short-term. This may bring many benefits, e.g. the spread of skills between projects. However, it also incurred higher transaction costs. Meanwhile, departmental staff will not be taking responsibility for commercial decisions and commercial knowledge of projects will be lost quickly when the advisors leave.

3.5 The General lessons of the PFI applied in the UK

The PFIs have been used in a wide range of social and infrastructure projects since 1992, but there are conflicting views on the uses of private finance in the public infrastructure and social services. The supporters (H.M. Treasury, 2000, 2003, 2006, PUK, 2007) say that private capital at risk has brought much-needed vigour and efficiency to building and maintenance of the public infrastructure and delivered more than would have been possible without them. However, the opponents (Gaffney and Pollock 1999; Price et al. 1999; Ruane, 2000, Ball et al. 2000; Akintoye et al. 2003; Shaoul, 2005, Pollock and Rice, 2010) argued PFIs are expensive and inflexible, and a drain on conventional public service budgets. They are a policy for the governments to evade public spending rules and fudge national accounts by excluding PFI liabilities. They also debated that real risk transfer takes place in the PFI projects (Committee on Economic Affairs, the House of Lords, 2009). Several criticized the increasing powers of the private sector leading to benefits to themselves rather than to the taxpayers. Finally, there is also a compromise view point offered by the IPPR (2000), Spackman (2001), Pollitt (2005) and NAO (2009), where they explained that ‘Private finance can deliver benefits, but is not always suitable at any price nor in every circumstance’ (NAO, 2009a :5). The IPPR (2002), the think tank of the Labour Party believed that, the PFI is not suitable for all industries, but it seems they performed well in the road and prisons industries, rather than in health and school sectors. Spackman (2002) and Pollitt (2005) recognized there are some issues and obstacles in the applications of PFIs, however these can be corrected and improved in any proposed projects in the future.

Based upon the debates and issues of the PFI, experiences and lessons can be drawn, covering both the central programmes and the individual project’s levels. Firstly, judging whether the government can get what they have claimed from the PFI’s application. The experience from the UK shows the government uses PFI like a super ‘credit card’ to develop public infrastructure and services, but paying for them in the future. PFI does bring private investments, but this is not additional to the government’s

budget, since the costs of PFI are substantially and entirely funded by the public sector, in the form of annual payments or unitary charges to the private sector over the next thirty-years. PFIs were also widely criticized as off balance sheet finance may produce future problems and put public financial management at risk. It was suggested therefore, that the potential debts and liabilities raised from the use of PFIs should be present in the government's financial statements, in order to maintain transparency and better management of the public purse and assets.

Secondly, the government hoped to achieve 'value for money' in delivering public facilities and services by utilising PFI schemes. This expectation was not easy to realise in practice. The higher cost of private borrowing and high transaction costs associated with PFI procurement and contracts. Plus the high premiums for risk transfer resulted in PFI deals being less economic than expected. It is also a good idea to set up a public sector comparator when evaluating whether a PFI proposal should be accepted or not in the planning and appraisal phases. However, the government needs to establish reliable value for monetary assessments to enable valid comparisons between the performance of a PFI project with a conventional procurement. The value for money assessment of PFI in the UK usually justified the project on very narrow criteria at the very earlier stages of procurement. Some costs and risks brought in by PFI were not fully addressed and properly valued in the decision-making process. In addition, the public client of the PFI seemed to lack sufficient measures to secure value for money in the post-contract and operational stages. There is a greater need for increased transparency in the way that value for money is tested, especially in the allocation and valuation of risk transfer from the public sector to private contractors.

Thirdly, it is widely agreed that PFI is a long-term contract involving construction, services and facilities maintenance and operation. The uses of the contract can bring benefits, as well as extra costs and risks. It was suggested by the Transaction Costs Economics, especially in public infrastructure and service sectors where they is usually a natural monopoly, that inputs and outputs are difficult to measure accurately. Due to

the incompleteness and longevity of PFI contracts, the uses of PFI may be expensive and bring some hold-up and lock-in risks to the public sector. The PFI contract is also inflexible, even small adjustments to the clauses or requirements of the contracts may be expensive for the public sector. The TCEs suggested that the relationships between public client and private sector should be strengthened to form a relational contract when the PFI is adopted. However, the evidence from the UK proved such relationships have not been built between the public sector and private contractors in most cases. Finally, public authorities were recommended to improve the management and monitoring of the PFI contracts in operational phases, to ensure that the private contractors delivered quality assets and services as required and specified in the contract.

Most importantly, the success of PFI is dependent on retaining and recycling expertise within the public sector, particularly project management skills. Awarding authorities can then operate from a position of equal strength with their private sector partners when negotiating contracts and operating facilities. There is a need for improved sharing of experience, lessons and expertise within the public sector across organisational and departmental boundaries, especially for the post-contract management and measurement phases.

Finally, it is still difficult to draw any conclusions about whether PFIs in the UK were implemented successfully or not. The government's original claims and expectations were that (H.M. Treasury, 2000, 2003, 2006), the PFI would introduce and mobilise private capital investments, achieve value-for money, and transfer and share certain risks relating to provisions of infrastructure and public services. If these benefits had been achieved through the utilisations of PFI schemes in the UK, then based upon the analysis of this chapter, the answer is inconclusive.

Many developed and developing countries in the world are going to learn, study and even copy the PFI programmes to improve their own countries' infrastructure and public services (H.M. Treasury, 2000, Holden, 2009, Committee on Economic Affairs, the

House of Lords, 2009, volume II). It is doubtful that the UK's model is suitable for other countries. However, its successes and failures and the various negative lessons could be learnt by other countries to avoid making the same mistakes as the British PFIs did.

3.6 The lessons learnt from the PFIs in the Road and Water Sectors

Although a few studies on the road motorway PFIs produced by the NAO (1998, 1999, 2003), the PAC (2011) and the scholars (Edwards, *et.al.*, 2004, Shaoul, 2005), the British road PFI, namely the DBFO model, has some important lessons for the other industries in the UK.

- The high cost of professional fees and private finance, inaccurate traffic volume forecasts,
- poor quality of planning works (in the cases of the M25),
- ineffective measures on the performance of PFI projects' construction and operation,
- Misuses of advisors as well as the shortage of experience and skills in the public sector were revealed by the NAO (1998, 1999, 2003) and the PAC (2011).

One unique aspect of motorway PFI's in the UK is the its higher returns on investment, along with the fewer risks were transferred as Edwards, *et. al.*, (2004) and Shaoul (2005) disclosed in their studies.

The water sector is not a targeted PFI market in the UK, because all major water companies in the UK were privatised in the 1980s, except for these in Scotland. As the data from the PUK (2010) indicated, only 7 water and sewage treatment PFIs have been developed in England, Wales and Northern Ireland. Another 9 water BOT contracts with 21 sewage treatment plants were developed in Scotland. There were few reports or information covering the performance and implementation of water PFIs so far (European Commission, 2006). However, the recent evidence from the Sunday Herald

newspaper (Edwards, 2011) exposed that there were serious issues on the Scottish sewage PFI projects in which the BOT model was applied. The local media revealed that almost all of the Scottish sewage treatment plants had not worked properly over the last ten years, suffering a series of mechanical failures, leaks and bad smells. Their performance have been so poor that Scottish Water has imposed financial penalties totalling £7.5m on these operators. A string of problems and operational failures were observed by the Scottish Water, a government-owned company, acting as public client of these sewage treatment BOT contracts. According to the internal review of Scottish Water investigation revealed that almost all of the sewage treatment BOT schemes had encountered some form of pre- and post-commissioning difficulties in the last ten years (2001-present) (Edwards, 2011). It is notable that the French water multinational contractors in Scotland were involved in some of the cases researched and also had similar operational issues in China.

3.7 The BOT in China and the PFI in the UK: the potential to learn

In chapter two and three, the previous studies of Chinese BOTs and British PFIs have been reviewed. The key points and factors from chapter two and three are classified and summarized in Table 3.9, page 157. This is done in terms of definitions, models, objectives, contexts, histories, development levels of the markets, development of private industries associated with private financed projects, the facts surrounding BOT and PFI implementation to date and finally implementing issues and lessons. Based on research from China and the UK, some facts about the implementation of BOT and PFI in these two countries can be compared here.

Although, there are major differences between the political, economic and social systems in China and the UK, it was found that similar ideologies underpinned the PFI in Britain and the BOT in China: such as Neoliberalism and pro-market thinking. These ideologies are controversial, but have profound influences on the decision-makers and politicians in both China and the UK. Following large scales privatisations and public

sector reforms at the time, both China and the UK started to use private capital to develop infrastructure and public services in their countries in the 1990s.

According to the PUK (2010) and the PPI's (the World Bank, 2010) statistics, both China and the UK are top leaders in developing and utilising private investments in the public infrastructure in the world, in terms of projects numbers and capital values. To date, there are 920 private financed projects with a capital value of £72 billion used to develop public infrastructure and services in the UK. Meanwhile, China has already implemented various forms and models of PPPs in 931 projects, with the capital value having reached about £70 billion (USD 111 billion) by 2010. Therefore, the scales of the Chinese and British PPPs' implementation are quite similar and comparable.

From this analysis, it can be seen that the Chinese BOT is similar to the British PFI programme. The experiences and lessons of the British PFI could be studied and applied to the Chinese BOT schemes, especially in the areas of how PFIs were contracted, how project risks were transferred and allocated, and what kind of practical problems have been met in the UK. For China, the experiences and lessons of British PFI may offer some valuable ideas and insight into how to improve its BOT policies, particularly in the fields of contract management, risks transfer and allocations. Finally there are still some areas of the Chinese BOT that need to be studied further. Existing research did not fully discuss questions: such as, why do the authorities in China want to use BOTs in practice? What have been the results of utilizing BOTs in China over the last few decades? What are the main problems and obstacles to utilizing and managing BOTs in the contexts of motorway and water industries in China at present? How can policies and implementations of Chinese BOTs be improved, based on the lessons learned and the experiences of British PFIs? By studying these questions in detail, this study ascertains what lessons China can learn from the development of the PFI in Britain and for China to make better use of their BOTs.

Table 3.9 The Facts of PFI in the UK and BOT in China
(Based upon the literature from the UK and China)

Items and Factors		
Definitions (PFI and BOT)		
	British PFIs	Chinese BOTs
Concession Contracts	Yes	Yes
Maturity of Contract	About 30 years	No more than 30 years
Bundling Design or Not	Yes	No (appears in recent case)
Payment Mechanism	Governmental Annual Payment or Unitary Charges (Direct Tolls were also found in a few of road and bridge cases)	Direct Tolls, 'pay-as-you-go', (In some cases, the public sector paid, while need further investigations)
Definitions of PPPs		
	British PFIs	Chinese BOTs
	Yes, all partnerships and cooperation between public sector and private sector	Not found, exchangeable concepts were found in official documents, such as, marketisation
Models of PPPs		
	British PFIs	Chinese BOTs
Concession/contract based	Yes (PFI)	Yes (BOT)
Joint-venture	Yes	Yes
TOT/Sale-lease-back	Not popular, in some cases	Yes
Others (ASB)	No (but, refinancing allowed)	Yes
Objectives (claims)		
	British PFIs	Chinese BOTs
Mobilizing private investments	Yes	Yes
Risks Transfer	Yes	Not specified, need to see the contract arrangements
Value-for-money	Yes	Not specified
Private management, skills or advanced technology (Innovations)	Yes	Not clear, in some earlier projects, need to study this further
Contexts and Backgrounds since 1979		
	British PFIs	Chinese BOTs
Neo-liberalism or pro-Market ideologies	Yes	Yes

Large scale of privatization	Yes	Yes, but only on medium and small SOEs at local levels
Fiscal difficulties and shortfalls	Yes	Yes (but, only for local governments)
Increasing powers and lobby of private sectors	Yes	Not clear
Urbanizations	Not significant	Very high speed (the real extent needs study)
Increasing social demands/updates on aging facilities/maintain pressures	High	Very high (the real extent needs study)
Other alternatives		
- Budget finance	Yes, but there is institutional bias, especially in NHS and Schools	Yes, but difficult to apply
- National Development Bank	No. (But, The Infrastructure Finance Unit was built)	Yes, in experiments, need further study
- Local Government Bonds	No.	Yes, in pilot tests, the effects need study
<i>Development Levels of PFI markets and private industries</i>		
	<i>British PFIs</i>	<i>Chinese BOTs</i>
Capital Markets	Well-developed overall (but, severely weakened in 2008)	
- Corporate Bond market	Well-developed	Not Clear
- Stock market	Well-developed	Developing
- Insurance market	Well-developed	Not clear
Banking Industry	Well-developed	Well-developed (state-owned)
Construction Industry	Well-developed	Well-developed (state-owned)
Consulting Industries		
- Financial	Well-developed	Not clear
- Legal	Well-developed	Not clear
- Technical	Well-developed	Well-developed (state-owned)
Capabilities of private contractors	Relatively strong	Not clear
<i>Facts of the Implementations - Scales (2010) (The PUK and The World Bank's Data)</i>		
	<i>British PFIs</i>	<i>Chinese BOTs</i>
Number of Projects (2010)	920 (PPPs)	931 (PPPs)
Capital Value (2010)	GBP 72 billion	About GBP 70 billion (USD 111 billion)
Scope	Central and Local Level	Local Level only
Industries	Economic and Social Infrastructures	Transport, Power, Water and Sewage treatment, Waste

		Treatment
Procedures	14 Steps	10 steps
Specified and unified PPP units in the central government	Yes (PPP Unit, H.M. Treasury)	Not found at central level, Not clear at local level
Policy and Regulation Framework	Relatively complete	A few policies and regulations have been issued
Standard Contract Models	Yes	Yes, but only for Water supply Sewage treatment and Solid Waste Treatment sectors
Complexity	High	Not clear, not studied
<i>Issues, Results and lessons related to Implementation</i>		
	<i>British PFIs</i>	<i>Chinese BOTs</i>
Degree of Transparency	Low, but higher than China's	Very low
Degree of Measurement	Low	Not studied, not clear
On-balance sheet	Not yet	Not clear, need further studies
Achieve Value for Money	Controversial and inconclusive, but failed in many cases	Not clear
Risks Transfer, allocations and premiums	Controversial, probably a few of risks transferred, but with high premiums	Not clear, a few risks were studied in literature
Transaction costs	High	Not clear, few studies addressed
Incomplete Contract	Found in many cases	Not clear, not studied
Contracting risks	Found in many cases	Some studies addressed from the private perspective
Relationships/Cooperation	Poor or inconclusive	Not clear, not studied
Contract Management and Monitoring	Poor or inconclusive	Poor, mentioned in some research
Expertise, skills and Training	Insufficiency in public sector	Insufficiency in public and private sectors, but effects and influences not fully explored
Degrees of competitions in procurement and tendering	Seems to be weaker, poor competitions	weak, but not fully discussed in the existing literature
Overall performance and effects	Inconclusive and Controversial	Not known no official or independent evaluations have been done yet
Private capital concentration and increasing control over the infrastructure market	Controversial, only a few studies addressed this	Not studied

PART THREE RESEARCH METHODOLOGY

Chapter 4 Research Methodology

4.1 Introduction

At the end of the last chapter, the lessons and experience of PFIs were examined and presented. However, the result of the application of BOTs in China still remains unclear, due to insufficient studies into this topic. This study aims to explore how BOT has been implemented in China and fill in some the gaps in the literature.

The research process used in this study follows a common path of PhD research. It starts with a literature review, then moves forwards to the derivation of a methodology and its application and eventually to data analysis and writing up. However, a more extensive pattern is employed in this thesis. A brief literature review on British PFIs and Chinese BOTs led to some initial pilot fieldwork in 2006. Based upon the fieldwork, this research went on to produce a further literature review associated with PFIs and BOTs. Research questions were formulated, judging to the fieldwork which processed to study the BOTs in motorway and water sectors in China's six provinces in 2008. A follow-up of 22 interviews, a focus group and two observations, this research followed which highlighted the results of the implementation and development of BOTs in China's water and motorway industries. This was followed by data analysis and writing up.

This chapter describes and explains the methodology, research approaches and design of this study. It provides justification for the approaches taken and the research methods adopted. The methods of data collection, as well as the sampling strategies are presented and justified here. In the last three sections of this chapter, the adopted data analysis method, questions of 'validity' and 'reliability', and the ethical issues are also discussed.

4.2 The formulation of research questions: literature review, pilot studies and secondary quantitative data analysis

The research questions of this thesis were subject to considerable reformulation as a result of a literature review and a pilot study in China. Both deductive and inductive approaches have been employed in the research process to explore the implementation of PFI in the UK and BOT in China.

Following a brief literature review, the data from existing research into PFIs and BOTs was retrieved and analyzed at the beginning of this study. An initial finding of the literature review indicated a ‘trend’ that both governments in the UK and China advocated the use of PFI and BOT in their country in the last three decades. This is an interesting ‘phenomenon’ that both the UK and China adopted a similar policy to develop their public infrastructure and services, while the social-economic contexts of these two countries significantly differed. This phenomenon led to a simple question: why have the governments in the UK and China both moved towards the use of private financing and contract-based methods (PFI and BOT) to develop their public infrastructure and service over the last three decades?

Guided by the theories of public choice, principal-agent and transaction cost economics, and with the help of the literature review on new public management, a deductive analysis offered the theoretical examination and explanation of PFI and BOT (chapter 1, 1.3). In addition, based upon a critical evaluation, this study drew on the lessons and experience of British PFIs, in terms of the extensive and readily available literature from the UK. However, why and how have BOTs been developed in China? The existing literature cannot fully answer these questions. Thereby, this research conducted an initial field work study in China during 2006

4.2.1 The pilot study

A pilot study was designed and conducted in 2006 in order to explore areas concerning the application and development of China’s BOT. At an earlier stage of this research, the question was too broad for a Ph.D study. Therefore, it had to be ‘narrowed down’. Another purpose of the pilot study was to re-formulate the research questions, as well as to justify whether a qualitative (or quantitative) approach was appropriate to this study. A qualitative semi-structured interview method was employed in the pilot study, in order to enhance understanding on other practice and context of Chinese BOTs. Seven

pilot interviews were arranged with the research participants from the provincial and city governments and the BOT contractors. Assistance was given by the author's friends, previous colleagues, school friends and relatives in China. There were 18 interviewees available on the shortlist at first, compiled by considering their working experience, careers and job positions associated with BOTs. Five officials from the provincial and city councils and two project managers from two BOT contractors were finally selected.

Table 4.1 Pilot Study: The in-depth interviews and interviewees by sector and organisation

<i>Interviewees Code (PL: Pilot Study)</i>	<i>The Interviewees' organisation and Locations</i>	<i>Position/Role</i>
PL1	W Provincial Government J city (Motorway BOTs)	Senior Director
PL2	J city (Cross-sectors BOTs)	(policy maker) Senior Director (project management)
PL3	K City Council, W Province K city (Senior officer Motorway BOT)	Senior Director (policy maker)
PL4	K city (Water BOT)	Manager (project)
PL5	K city (BOT related department)	Manager (planning)
PL6	Private Contractors K city, Gas Joint-Venture Project (70% share in the SPV)	Senior Manager (Project Management)
PL7	K city, a water BOT	Director (Project Management)
Total	7	

A question schedule was used in the interviews based upon the research question, as well as literature (see appendix 7). These questions covered a wide range of topics: background of interviewees, jobs and experience with BOTs, implementation of the

BOT, outcome and performance of the BOT, plus feedback and suggestion (see Table 4.2). The pilot interview questions were broad, since the author attempted to give more time to interviewees to talk about their experience on implementing motorway and water BOTs.

Table 4.2 Pilot Study: Interview Questions Guide

Question	Areas
A	Background of Interviewees
B	Jobs/Experience with BOTs
C	The Organisation/institute and BOT
D	Implementation of the BOT
E	Outcome/performance of the BOT
F	Feedbacks and Suggestions

Every pilot interviewee was given the introduction and information letter about this study by email, before agreeing to participate (see appendix 5). Once they had agreed, they were given a consent form for this study, at the beginning of the interview (appendix 6). The consent form reminded them that they had volunteered to take part in the study without any recourse to any form of payment or gift. They had the right to refuse to answer any questions they did not want to. Furthermore, they were free to withdraw from interviews at any point without giving a reason.

During the period of September-November, 2006, these seven pilot interviews were conducted in Chinese (Mandarin) and at the interviewees' offices during the lunch or work time. All interviews lasted between one and two hours, which was much longer than the author had expected. As these interviews were part of a pilot study, the interviewer tried to ask as many questions as he could. All research participants cooperated very well, and the answers they gave were detailed. The interviews were recorded using a Samsung MP3 player which could record over fifteen hours of conversation.

The analysis of the pilot studies' data led to the view that this research was better approached through an analysis of *how* the BOT model has been applied to Chinese

infrastructure and public services and *in what context*. In addition, the initial study findings indicated that the Chinese provincial and city governments took over management and governance of BOTs from 2004, since the National Development and Reform Commission decentralized BOT approvals. Thereby, this suggested the subsequent research needed to focus on how BOT operated at *provincial and city level*. The target interview participant groups were the policy-makers, project managers and practitioners (legal, financial and technical BOT experts) in the governments and public agencies. They were a rich source of BOT data and information. The 5 pilot interviewees suggested the researcher that the in line departments at provincial and city's governments (e.g. motorway and urban utilities), the local Reform and Development Commissions, and the governor and mayor's offices of local councils had more information and BOT experts than other departments. Furthermore, the pilot study revealed that *motorway and water industries* were key sectors of implementing BOT in China in the last ten years. This informed the research should pay more attention on the BOT projects in the water and motorway sectors. Finally, most BOT projects located in the *central and eastern China* from 1999, due to the strong economic performance in these areas. Last but not least, the pilot study indicated that the qualitative approach was appropriate for this study. Rich information collected from these seven interviews, it was helpful to enhance the interviewer's understanding on China's BOTs.

After the pilot study in China in 2006, the author moved to the further literature review related to BOTs and PFIs. During the period of 2006-2008, the author also considered other methods to conduct his research, e.g. by means of quantitative postal questionnaire. But, the quantitative survey was not employed in this study finally, due to its fairly low response rate in pilot tests, the limitation of this method (e.g. ignorance on the contextual variables related to BOTs) and the complexity of the BOT practice (the complicated interaction and relationship between public and private sectors).

4.2.2 The Quantitative Data from Secondary sources

During and after the course of the initial pilot fieldwork in China (2006-2008), 13 unpublished governmental documents associated with Chinese BOT were collected from the research contacts at governments between 2006 and 2008. Ten of these thirteen unpublished reports were in relation to Chinese BOT's policy, implementation and

performance. These reports were produced by the different levels of the governments of China in 2005, 2006 and 2008. Those internal BOT documents of the governments covered a large amount of information about Chinese BOTs, such as, the number, contract value and location. Four research reports produced by the central government what focused on the Chinese motorway and water BOTs and other forms of PPPs. One annual report about the infrastructure in a province was collected from a research contact at the provincial government. Furthermore, eight BOT related documents were gathered from government departments and agencies at city level. Permission was to use these documents for the academic purposes (see table 4.3).

Table 4.3 The Quantitative Data and Their sources

Sources/BOT Data	Motorway BOTs	Water/Sewage Treatment BOTs
Central government	2 BOT Reports were collected in 2006/07	2 PPP Reports were collected in 2007/08
Provincial Government	1 report collected in 2008 (cross-sectors BOT)	
City level Government	5 official documents were collected (Cross-sectors and not specified BOT/PPP) in 07/08	
Public Agency/company		3 documents were collected in 2009

Although, a detailed analysis of these reports is presented in the next chapter, discussed here are some key point and findings that reshaped and re-formulated the research questions and approach. The quantitative analysis on these secondary documents indicated that over 60% of Chinese BOT projects (in terms of the numbers of projects) were *motorway and water projects*. Most of these projects were located *in eastern and central provinces*. These two indicators complied with the results of the pilot interviews. In addition, the statistics within the two of governments' research reports presented that over 90% of Chinese water BOT projects (in terms of project numbers) were *medium and small size* projects with a project value of under RMB300 million (£28 million) and production (or treatment) capability were under 120,000 tons per day. Finally, *Chinese*

domestic BOT contractors occupied a large portion of Chinese water and motorway BOT markets at the expense of international investors since 2002. Through the quantitative and qualitative analysis on these 13 reports collected from the central, provincial and city's governments, the initial findings informed that the subsequent research needed to focus on

How BOT was developed and applied in motorway and water sectors at provincial and city levels located in central and eastern China?

Also, this study needed to pay more attention to *the medium and small size water projects*, since these kinds of projects are the majority of water BOTs in China. In addition, the *Chinese domestic BOT contractors* need to be addressed, due to more and more BOTs being undertaken and commenced by this group of private investors. Meanwhile, the initial findings of the pilot study and document analysis also indicated that there were some similar problems that had occurred in the application of the British PFIs (e.g. poor contract management, lack of skills and experts in the public sector). This finding suggested there is a certain similarities that between PFI and BOT. It is possible to consider the view that China could learn some lessons from the uses of PFIs in the UK. However, more robust evidence was needed through subsequent research.

4.3 Methodology

This research is typical of that used within social science and employs a qualitative approach. However, this study also includes some elements of the quantitative research (e.g. a quantitative analysis on the secondary data and even on the primary qualitative data). The 'public policies' in the UK and China, both of BOT and PFI, can be analyzed following the sociological traditions based upon a 'phenomenology' (otherwise referred to interpretivism). Phenomenology refers to 'a philosophy that is concerned with the question of how individuals make sense of the world around them and how in particular the philosopher should bracket their own preconceptions in his or her grasp of that world' (Bryman, 2008:45). In contrast to phenomenology, another paradigm of research philosophy is positivism (or quantitative or objectivism), which refers to an epistemological position that advocates the application of methods of the natural

sciences to the study of social reality and beyond (Bryman, 2008, Denscombe, 2007, Remenyi et. al., 1998). These are two different epistemological frameworks. The methodological underpinning of this research primarily lies on the phenomenology, but is supplemented by thoughts of positivism. The quantitative analysis on the literature review and the unpublished government's reports essentially inspired the researcher. The design of the research brings together the thoughts of two research paradigms: one (positive analysis) informs another (phenomenology).

The most important reason for preferring the qualitative approach in the work presented here is that the research questions used need in-depth information which cannot be achieved through quantitative means (Denzin and Lincoln, 2005). Strauss and Corbin (1998) provide a helpful definition of qualitative research, 'By the term 'qualitative research' we mean any type of research that produces findings not arrived at by statistical procedures or other means of quantification' (Strauss and Corbin, 1994:11). Secondly, flexibility is the key advantage of a qualitative approach. The procedure of qualitative data gathering is much more open as it does not require predetermined procedures and pre-tested instruments. As Blaikie (2000) puts it, 'They (qualitative researchers) see research as a learning process and themselves as the measuring (data-absorbing) instrument. They will want to allow concepts, ideas and theories to evolve and they will resist imposing both preconceived ideas on everyday reality and closure on the emerging understanding' (Blaikie, 2000: 243). Thirdly, a qualitative approach has advantages as a method of gaining detailed information with limited resources. For instance, new issues can be identified and probed during a flexible interview process.

However, this study is not 'purely' qualitative research. It is in the field of public financial research, and inevitably it includes a large amount of quantitative data from secondary and primary sources that needed to be analyzed. Through the quantitative analysis on data of Chinese BOTs and British PFIs, this study identified a 'phenomena' that both the governments in China and the UK actively promoted the private participation in their infrastructure projects. The 'trends' of the development of BOTs and PFIs in the last three decades were also discovered via the quantitative analysis. Without all of this analysis, the research was not able to proceed. In other words, the results of the 'quantitative analysis' informed subsequent 'qualitative research' (Denscombe, 2007, Bryman, 2008). Secondly, quantitative data analysis also allowed

this study to identify the location and distribution of BOT projects in China. The quantitative analysis on the governments' reports and documents indicated that a large portion of BOT projects were located in eastern and central provinces. This finding largely reshaped the research questions of this study. The method of research used is a mixed method which brings together the qualitative and quantitative approaches.

4.4 Conducting the research: the data collection methods

In order to understand Chinese BOT's implementation in motorway and water sectors, three methods of data collection were adopted in order to obtain the different types of data needed for this study. These include: interviews, a focus group and observation.

4.4.1. Interviewing as a data collection method

The interview was one of the important means of collecting qualitative data, to access people's experiences and their perceptions of reality (Bryman, 2008). An interview is not just a conversation, since the scholars plan a certain agenda for the discussions, and attempt to guide the interviewing process (Denscombe, 2007). These opinions, perceptions and experiences of research participants usually cannot be gathered and are difficult to access by other quantitative data collection means. Interviews can be divided into three categories: structured, semi-structured, and unstructured (Denscombe, 2007). In this study, semi-structured interviews were employed to collect data about the implementation of BOT schemes in China's local infrastructure projects using different interviewee groups. Semi-structured interviews offered a number of advantages for this study. As Denzin and Lincoln (2000) , Denscombe (2007), and Bryman (2008) stated, the interviewer can gain valuable insights based upon the depth of the information gathered and the wisdom of key informants. The interview is flexible in the research practice and can achieve high validity, since the data collected can be checked directly with the research participants. The semi-structured approach enables a rich level of data to be gathered while avoiding the difficulties of data analysis, categorising, and coding of unstructured interview (Denzin and Lincoln, 2000). As noted in chapter 3, interviews have been widely used in studies in the UK to explore the problems and difficulties of implementation of the policy in the PFI (such as, Greenway, et. al., 2001, Ruane, 2002, Edwards, et. al, 2004). However, interviews were not a popular data collection method

in the studies surrounding China's BOTs, since it was difficult to recruit key informants and interviewees. It was important to use the interview as a method to collect data in this study to investigate the perceptions, experience, opinions and attitudes of the BOT policy-makers, project managers and other practitioners.

Purposive sampling strategy and interview recruitment

For this research, there was another important: *who* should be selected *from where*. This involves the organisation of sampling in the research. Sampling strategy in this project is purposive sampling, which aimed to recruit people who had participated in at least two BOT projects. The goal of the research was to find a group of BOT experts who could provide direct and important information about how BOTs were implemented in Chinese water and motorway projects. Creswell (2007:127) explained, the 'purposive sampling means that the researcher selects individuals and sites for study because they can purposefully inform an understanding of the research problem and central phenomenon in the study'.

Furthermore, snowball sampling method was also adopted in this research, since the BOT experts was difficult to access. The snowball sampling was probably the only feasible way to select more research participants in a limited time period, when there was no adequate list available for this research. As Bryman (2008) commented, in the ways of snowball sampling, the researcher makes initial contact with a small group of people who are relevant to the research topic and then uses these to establish contact with others. By implementing the 'snowball sampling', three pilot study interviewees and one previous colleague of the author offered great help to suggest and arrange potential research participants. The other 16 semi-structured interviewees were selected in this way.

From another perspective, this study also employed a stratified sampling strategy, which is a technique in which a population is divided into mutually exclusive groups (called strata) and then a systematic sample is selected from each group. In this case, it was considered that people in different 'professions' may have different points of view on the implementation of BOTs. By reviewing the profiles of interviewees, it was possible to identify research participants in terms of their professions i.e.2 policy-maker (decision-makers), 9 project managers, 5 financial managers, 4 contractors and 3

consultants of BOTs. The researcher noticed that the ‘weight’ of project managers and financial management participants from the government are high in the sample. This is because the research questions explore the outcomes, results and problems of BOT’s implementation from a public sector’s perspective. A major portion of the sample (17 research participants of 26) were from the local governments and public agencies in China’s 6 central and eastern provinces, this was informed by the pilot study and initial findings from the document analysis, see the profiles of the interviewees (Table 4.4, page 172).

Finally, all research participants and the projects involved were located in the six provinces of central and eastern China. The challenge of sampling strategies used in this research may be the ‘generalisation’ issue. For qualitative studies, the ‘generalisation’ (external validity) is a disadvantage, since the population of the sample is small (Creswell, 2007, Bryman, 2008). It is difficult to say that the findings of this study could be adapted and generalised to others. For this study, the sample selected is not a typical case, but an extreme case in terms of locations of the ‘population’. In this research, six provinces and their governments are the most active advocates of BOTs in China. Hundreds of BOTs have already been developed and implemented by the governments. Therefore, the development and application of BOTs in these six provinces may be extreme cases in China. The practice in these six provinces cannot be deemed as representative of ‘typical BOT practice’, but as ‘best practice’. The problems and best practice explored in this study may be applied to other projects in China where similar problems can be found.

Interview process

All of the interviews were carried out in the period August-October, 2008, by the researcher in the Chinese language at the participants’ offices face to face. A week before each interview took place, the interviewee was given or emailed an introductory letter (Appendix 5) on the research topics to be covered and a consent form (Appendix 6) declaring they are happy to attend the interview on a ‘voluntary base’. The interviews were tape recorded. The question schedule used in the interviews was developed based upon pilot interviews. One was for managers from the public sector (see appendix 8) and another for 2 private BOT contractors (see, Appendix 9). These questions covered a wide range of topics: for instance, procedures and mechanisms of implementing BOTs,

outcome, performance, problems of the BOTs, the relationship of BOT client and contractors with suggestions. Seventeen semi-structured interviews were conducted in the offices of the research participants during this period. Since the interviewees had accepted the invitations of this study, participants were given different choices of time and place for the interviews, similar to the pilot study. All preferred to be interviewed in their own offices, except for two cases, where the interviews were conducted in homes of the two interviewees. Furthermore, all interviews were carried out during evenings of working day or at weekends. This was usually out of working time, because the researcher and the interviewees needed enough time to conduct the research.

Table 4.4 Semi-structured Interviewees by professional history, job position and level, industry and projects

Interviewees Code	Professions	Sector	position	Project involved Water/Motorway/ Mixed/others
INT 1	Project Manager	Government	Director	Mixed
INT 2	Decision-maker	Central Government	Senior Director	Mixed
INT 3	Project Manager	Government	Manager	Mixed
INT 4	Project Manager. And Finance	Government	Senior Director	Mixed
INT 5	Finance	Bank	Manager	Mixed
INT 6	Finance	Government	Manager	Mixed
INT 7	Finance	Bank	Manager	others
INT 8	Finance	Bank	Manger	Mixed
INT 9	Legal	Government	Director	Mixed
INT 10	Legal	Government	Director	Mixed
INT 11	Policy-designer	Central Government	Senior Director	Mixed
INT 12	Consult (Fin.)	Consulting	Director	Mixed
INT 13	Project Manager	Government	Director	Mixed
INT 14	Decision maker And project manager	Government	Senior Director	Motorway
INT 15	Legal	Consulting	Senior Director	Mixed

INT 16	Legal	Consulting	Manager	Mixed
INT 17	Project Manager	Private	Manager	Motorway
INT 18	Project Manager	Private	Manager	Water
INT 19	Policy research	Government	Manager	Mixed
INT 20	Policy research	Academic	Manager	Motorway
INT 21	Project Manager	Government	Manager	Mixed

The interviews usually started with simple questions about personal information, professional and career histories. When both the researcher and the interviewee had relaxed and were more familiar with each other and their environment, the interviewees were asked to explain their own understanding, experiences and stories concerning BOTs. Then, depending on their responses specific topics were selected and questions prepared to get further information. Most of the time, the researcher directed the conversation in the interviews. All interviews usually lasted between one and two hours, the research participants cooperated very well, and the answers they gave were detailed. The sensitive questions, such as the ‘corruption’ issue in BOT, were answered by 20 interviewees, but one interview participant refused.

At the end of the interviews, 12 interviewees showed their strong interests in the British PFI programme. Therefore, a number of questions had arisen on the implementation of motorways, as well as the privatisation of water industries in the UK. These interviewees are very interested in learning lessons and gaining experience on using motorway and water BOTs.

4.4.2 conducting focus groups: sample selections and gathering qualitative data

Focus groups can be used for many purposes. In this research it was used to diagnose the potential for problems within BOT projects, particularly the interaction among BOT team members from public sector. Some research methodologies advocate the use of a focus group or group interviewing. Combined with other research instruments, e.g. in-depth interviews, the focus group can make important contributions to the research, enabling the researcher to explore views, perceptions, and motives through *group interaction* (Creswell, 2007).

By reviewed the literatures of PFIs in the UK and BOTs in China, there are not many

studies who used focus groups in their research, excepted for a few of studies conducted by Hall, et. al. (2000) and the NAO (2008) in the UK. Since the BOT scheme is complex in practice, a project usually involves a number of stakeholders and participants from different departments of governments and private contractors. The focus group was designed and carried out to explore the relationship (partnership or cooperation) and interaction between different participants of a BOT project from the public sector. This focus group was designed to explore the implementation of BOTs at project level, to look at the different thoughts and interests among the different departments in the public sector. Furthermore, it considers the organisation structure, power structure, incentives and efficiency matters within a public BOT team. Finally, this focus group was carried out to supplement the interview data. The focus group was organized in a city's Urban Development and Investment Company (a Local Government Financing Vehicle), using BOT contract clients who represented the interests of the city council in central China.

Focus Group Recruitment

The focus group was organized, recruited and assisted by a research participant who worked in the company. The 8 participants took part in the discussions after a meeting held at that company. They included people from the mayor's office of a city council, the urban planning and management department, the construction committee, the local Development and Reform department and the local Urban Development and Investment Company.

The participants of the focus group were selected purposively and opportunistically. Firstly, the members of the focus group included the directors and managers from 7 departments of the city council, involving the decision-making department, BOT approval, and management, legal and financial departments. In other words, the 8 members of this focus group comprised a 'typical' BOT expert team from the local council which representing the 7 departments' interest. Secondly, this focus group was conducted opportunistically. The author was undertaking his observations in the city's Urban Development and Investment Company during the period of August-October, 2008. Then a BOT project manager (BOT contract client) in this company informed the author that a BOT progress review meeting was being held in the company in

September 2008. The author was allowed to attend the meeting and conduct a focus group afterwards (launch time, 12:30-14:30). Finally, the author attempted to organise another focus group by himself in October 2008, with several managers working in BOT private contractors and consulting firms. However, time schedules of the proposed members of the focus group meant it was not possible to organise. Base upon the experiences and lessons of this study, it was better and easier to conduct the focus group study on an 'existing BOT team' rather than the author try to organise one by himself.

Conducting the focus group

The information and introductory letters for this study were sent to the research participants before the start of the focus group. The focus group took place in a quiet meeting room in the Urban Development and Investment Company. The author was introduced by a senior officer who worked in the city council (one of the participants of the semi-structured interviews) and the research participants quickly introduced themselves. Then the discussion topics were circulated allowing the participants to discuss, challenge and argue freely within the processes of the discussions. The discussions were mainly based upon the 4 motorway and water BOT projects (but not limited to them) which this BOT team had worked on. The questions covered a number of areas, but specific questions which differed from the interviews were designed: such as,

- Which department should direct the BOT team on the public side?
- What are responsibilities and commitments for the BOT team as a whole and for the different team members represented and their departments?
- Given this team is temporary, what benefits or costs will it bring to the team members? What will happen when arguments arise between team members?
- And what arguments are often raised?

The focus group discussion lasted about 2 hours. During the process of the group interview, the questions were discussed by different participants from the different departments of the local council. Some participants argued and challenged each other over the course of the focus group.

4.4.3 non-participant observations: project selection and observation as a mean to

gather data

Observational research has a long history in social sciences (Crowther and Lancaster, 2009, Denscombe, 2007). Observation is usually defined as a data collection method through looking and noting. The data is collected not based upon what people say or claim, but what they do or what actually happens. Therefore, it is clear that observation is a quite different data collection method, compared with interviews and focus groups which are based on the research participants' feelings, perceptions, attitudes and experiences. The observations were adopted in this study to look at the relationship, collaboration and conflicts between BOT clients and contractors. Meanwhile, the progress and performance of the BOT projects in the procurement, construction and operational stages were studied.

Recruitments on the observational projects and samples

Two observations were held in two phases, firstly, in a city's two BOT projects, during the September-November, 2006 and secondly between August-October, 2008. One observation was of a motorway BOT project located in W province (75 km from a provincial capital city to an international airport, the project capital value was over RMB 3 billion, £300 million). The other was a medium-size BOT sewage treatment project located in a city, W province (processing capacity was 160,000 tons/day, capital value was RMB 230 million, £23 million).

These two projects were chosen for a number of reasons: the researcher was familiar with the research participants (BOT project managers) and the projects over a long time, therefore, a relationship of trust had been built. Secondly, these two projects had many features typical of Chinese BOTs in the motorway and water industries. So, these two projects could be treated as representative cases of China's motorway and water BOTs. At the same time, the local city and provincial governments where the projects were located, are active promoters of BOTs in China, and were treated as examples of 'good practices' by other local authorities. Finally, in the period August-October, 2006, the water BOT project's plant A finished the construction work and was put into operation. Plant B was still in the procurement process (negotiation). The motorway BOT was also preparing for the procurement work at the same time. Therefore, the observations on the project managers' activities and behaviours, as well as the progress and process of the

BOT projects in this period generated valuable primary data on how motorway and water BOTs were prepared and procured. Furthermore, in the period of August-November 2008, the water projects were finished construction and commenced into full operation. The water BOT projects therefore offered a good example on the operations of the China's BOT project. The motorway BOT project finished the procurement work and was still in construction in 2008.

These two observations were encouraged through personal contacts, and assisted by one water BOT project manager from the public client (the governmental department), and one senior director who worked in the city council (the motorway BOT team director). The permissions for the observations had been given by these two project managers and their superiors and leaders. The managers of private contractors were also informed that a student studying in the UK was taking observing their projects and collecting his data. Therefore, the research participants (respondents) knew they were observed. The project managers of BOT contractors agreed and welcomed the researcher to do his observations, and promised any assistance if it be needed. There were certain disadvantages of using revealed observations in theory, for instance, the research participants may change their behaviours or activities if they know they are being observed. At the same time, unrevealed observations may involve more ethical issues. From the Chinese cultural and contextual perspectives, unrevealed observations may be treated as 'peeping activities', and are regards as very impolite to the research subjects. Therefore, the managers and staffs of BOT projects were informed in both cases of the observations. And in these two observations, the researcher did not take part in any of the research participants' work, but stayed just as an outside observer. This is because this study and the observations intended to understand the processes of developing motorway and water BOTs by the 'natural organisation' under real situations or circumstances. It was also studying the behaviours and activities of the BOT project managers and the real relationship between the BOT project's clients and contractors.

Conducting the observations

The non-participative observations were conducted in the periods August-October, 2006 and August-November 2008. The researcher regularly visited two BOT project

managers every week (3 days a week) and attended at the construction-sites (once every month). The author was also allowed to attend the projects' progress meetings. To keep track of observations, several techniques were used: simple note-taking, on observation diary and a simple checklist were recorded and prepared. These notes on what was seen and heard were used to refresh the author's memories about what took place. The observations focused on two broad categories: firstly, the behaviour and action of the managers from the BOT clients (included, frequencies of the meetings with private contractors, the relationships/collaborations/conflicts with private contractors and other public departments related to the BOT projects), secondly, the performance/progress of the BOT projects (involving the key progress/performance indicators and events). By using this method, the processes of procurements, constructions and operations of BOT projects and the complex relationships between the BOT clients, private contractors and other stakeholders were explored. The frequency of the number of meetings between private contractors and the public clients present the amount of the communication and cooperation between them.

4.5 Analysing data

A general qualitative data analysis consists of three steps: firstly, the data collected from the primary sources is prepared and organised. In this step, the interview data or focus group data should be written in transcripts for analysis. Secondly, a researcher needs to divide and reduce the data into themes through a process of coding and then condensing the codes. Finally, data needs to be presented in figures, tables, or a discussion (Denscombe, 2007, Creswell, 2007, Humberman and Miles, 1994). Although there are different suggestions on organising data for analysis in different research approaches, these three steps are basic components of a qualitative data analysis.

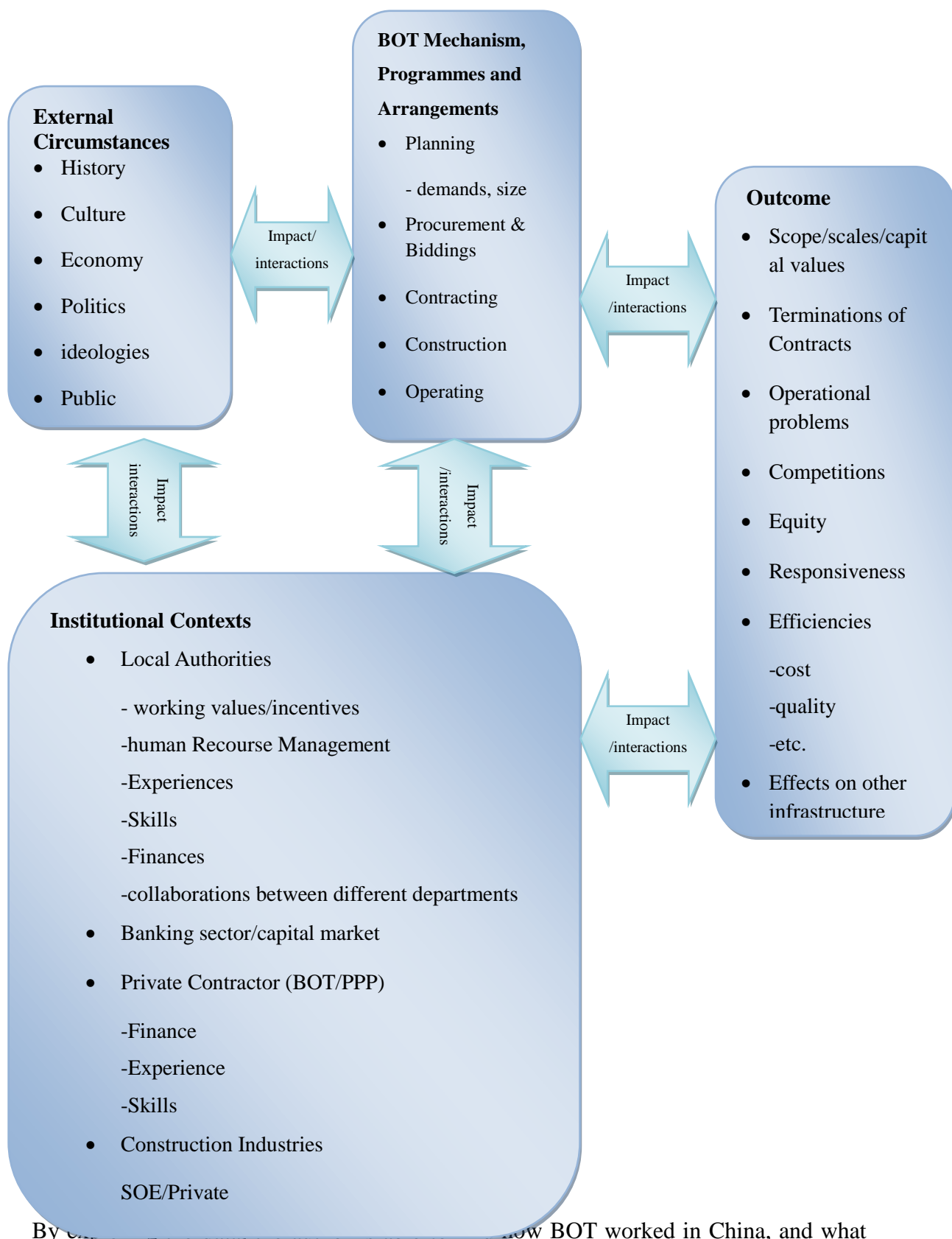
In this study, the qualitative data gathered through semi-structured interviews and the focus group was transcribed by the researcher in mandarin Chinese at first. The majority of the interviews were transcribed from audio-recordings, while in three cases notes were made in terms of the interviewees' responses. During the process of data preparation and organisation, the author had to translate a large amount of data in the Chinese language into English to be used in coding and analysis. It is difficult work translating Chinese interview responses and records into English and very time

consuming. Differences in the Chinese and English languages, made it difficult not to avoid misunderstanding and misusing words produced in the translations. However, the author found that Chinese data did not have to be translated into English, due to the new version of the computer software Nvivo which was able to process and code the data in Chinese language and characters. Therefore, the researcher was able to analysis the readily available data in Chinese, then translate the final results into English. All transcriptions in Chinese were filed as Word documents, then saved as electronic copies into a database. For a better understanding of the content of the qualitative data, the author read and re-read the interview transcripts for avoid missing key information, and to identify ‘critical instances’, highlight key passages of transcripts or make notes on the transcript, all with the assistance of Nvivo.

The second stage of data analysis focused on data selection, simplifying, abstracting and transforming the information. It went on to identify and compare cases and themes, in order to find connections between the categories and define their properties e.g. the objectives, context, pre-conditions of Chinese BOTs. The final step is ‘selective coding’s which will identify a core category and themes to eventually generate a theory for the work. Via coding and indexing raw information, the various pieces of data about Chinese BOTs were classified into conceptual units and categories. Finally, all the data together is displayed in a diagram.

Through qualitative data analysis, it was possible to classify data themes. These categories (themes, sub-themes, and sub-sub-themes) can be used to explain and identify the main aspects of the subject matter under study. Finally a core is found in order to develop new suggestions and policy recommendations for the Chinese BOT policies’ development in the future. Informed by the theoretical framework of Rose (2007), the data analysis concentrates on five key and broad themes, including: external circumstances (Context), institutional context (capabilities), BOT model and their arrangements, outcome and problems, following with analysis of the interactions and influences between the four themes. The example can be showed in chart 4.5.

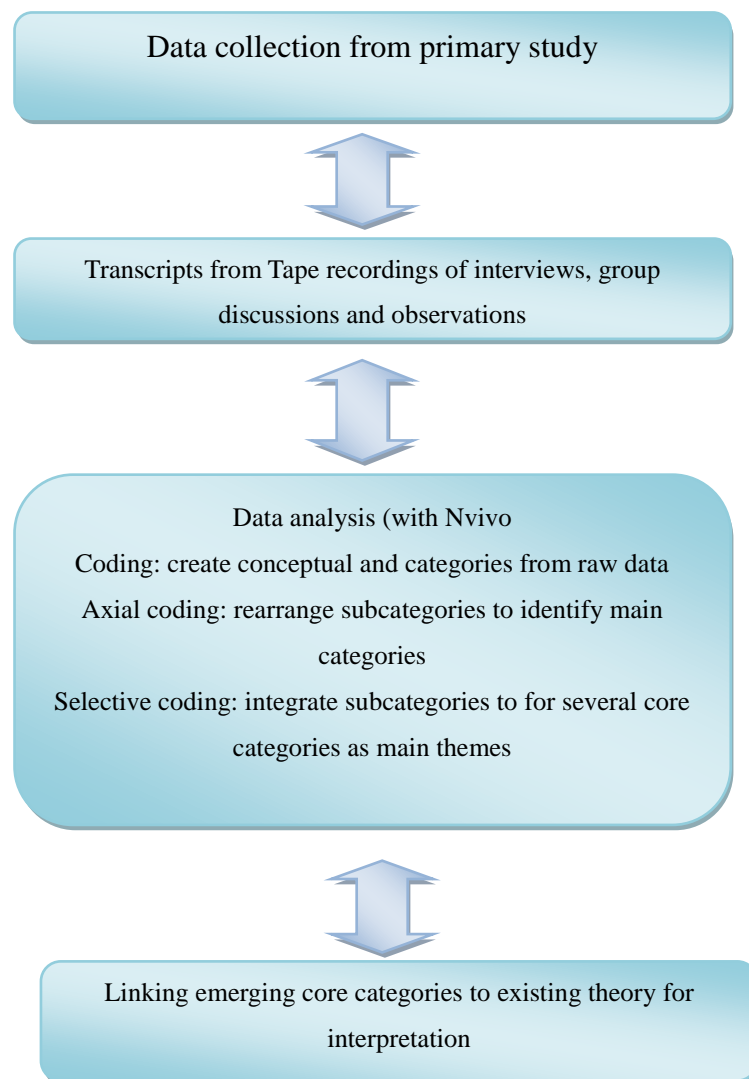
Chart 4.5 Data Analysis, Coding and Themes: Themes and Sub-themes



By comparing the data, we can see how BOT worked in China, and what

outcomes and problems existed for implementing motorway and water BOTs. At the same time, by considering the institutional contexts, resources and capabilities of Chinese governments, this study can identify the relevant lessons to be learnt from the British PFIs. Finally, the connection and interaction between different themes were also identified. The process of the data analysis as presented in the Chart 4.6:

Chart 4.6 Data Collection and Analysis flow and steps



Sources: Adapted from Bryman (2008)

4.6 Research ethics

Bryman (2008) and Descombe (2007) recommended that the ethical issues in social sciences should be considered by researchers carefully. In the case of this study, the researcher met some ethical problems, during the period of collecting data in China. Crowther and Lancaster (2009:55) outlined some possible ethical dilemmas, including: confidentiality, conflicts of interest, issues concerning honesty and integrity, discrimination, responsibilities toward on organisation, responsibilities toward people, individuals, and issues of competence. In this study, only some of these ethical dilemmas were evident, as well as other ethical issues specific to this research experienced during data collection. Three issues directly related to this study, such as informed consent, confidentiality and honesty (in the observation) were met by the author.

Research ethics were considered throughout the whole period of study. Firstly, the ethical approval had to be gained from the university in terms of the requirements of research ethical guidelines of the Leicester Business School, De Montfort University (See appendix 11). Secondly, before each interview, a letter and consent forms were given to interviewees to explain the research objectives and processes and any other detailed information. Thirdly, all participants and their responses would remain confidential and anonymous in the research, and all interview data was to be used exclusively for academic purposes. Fourthly, during the interview processes, three research participants refused to have their conversations taped, so note taking was made instead. Fifthly, in the two on-site observations, the researcher introduced himself to the research participants in the observations. The research participants in the observations were informed avoiding any ethical issues which can happen in ‘unrevealed’ observations. Finally, due to this study being cross-national research, some cultural differences were experienced in the research work (Smith, 2005). Some interviewees were unhappy about signing the ‘consent forms’, because this arrangement made them feel very uncomfortable (e.g. ‘loss face’ or ‘distrust’). Therefore, in three cases, the consent forms were not signed. However, the researcher read it to the interviewees and oral permission were made. The second matter was that some interviews were conducted at lunch time with the researcher paying for the research participants meals which in China is basic polite and social rule. However, this might be restricted by the ethical code of practice in social research in the UK.

4.7 Reliability and Validity

There is a wide debate on qualitative studies about reliability and validity (Becker and Bryman, 2005, Bryman, 2008, Black, 2002, Denscombe, 2007), because of the sample size, possible bias and misunderstandings in qualitative data collection and analysis. Compared with quantitative data, qualitative data and its analysis is more unstructured, subjective and usually based upon small size samples. This can lead to the data being misunderstood, misinterpreted and difficult to generalise (Denscombe, 2007). Crowther and Lancaster (2009) pointed out the central issue for qualitative research is that the researcher has to ensure the findings and conclusions generated through the analysis and interpretation of qualitative data, are reliable and valid. Reliability refers to how consistent and replicable are the results of the research. It is important for a particular data collection method to achieve the same results in different occasions with different research (Denscombe, 2007, Crowther and Lancaster, 2009). Validity means whether a study actually investigates what is intended to be investigated. The concept of validity considers the accuracy and precision of the data collection and analysis done by the researcher. It is argued that the qualitative approach is not so 'scientific' and 'objective' (Bryman, 2008). This research adopted the mixed research methods, while the qualitative approach is dominated. Therefore, the discussion on the reliability and validity of this research focused on the issues related a qualitative method.

4.7.1 Validity

Creswell (2007) commented that there are a number of techniques to improve the validity of a research, e.g. triangulation, peer review, refining the working hypotheses as the inquiry advances, clarifying researcher bias from the outset of the study, checking with research participants on the credibility of the findings and interpretations, rich and detailed description and external audits.

Validity requires checking results via further interviews or in some other way such as triangulation. Triangulation in qualitative research is necessary, and it will give much more reliable results than concentrating on one perspective. The aim of triangulation is to give a more holistic and contextual portrait of the subject matter under study as well as providing a way of validating initial observations (Denzin and Lincoln, 2000). Since a mix of data collection methods were used in this study, the researcher triangulated the

data constantly via multiple sources, e.g. primary data, secondary data and archival data from the governments in China. Although the main data of this study came from semi-structured interviews and the focus group, the related quantitative data from the literature review and the official statistics of the Chinese governments often were checked, to ensure the validity of this research. In addition, in the process of data collection, analysis and writing up, the researchers checked often the findings with the research participants, in order to make sure their views, opinions and interpretation were not misunderstood. In this way, the research participants were able to judge the accuracy and credibility of the account.

4.7.2 Generalisation

Generalisation refers to the findings of research if it is transferable to other social settings (Crowther and Lancaster, 2009). In the case of this thesis, the question is the findings of this research whether they are able to be transferred to other provinces in China. The generalisation meant a research should involve a large number of samples and representatives of a large population. The qualitative research approach was often criticised because of its small sample size, which cannot be generalised. In this study, the generalisation (external validity) is a crucial issue, since the sample is selected purposively. The ‘population’ of the sample is small and includes a number of ‘extreme cases’ rather than typical cases of BOT practice. In this study, all data was collected from the 6 provinces of China, thereby it is difficult to ‘empirically generalise’ the findings and conclusions. However, as it has been discussed in the previous chapter, the location of China’s BOTs is concentrated in a few eastern and central provinces. To study Chinese BOTs, this study inevitably needs to focus on the provinces which have a large number of BOT projects and with extensive experience of BOTs. The six provinces and their governments actively developed over 380 motorway and water BOT projects in the last seven years. The experiences of these provinces were highly advocated by the Ministry of Construction and the Ministry of Transportation. The lessons or best practice explored in this study may be applied to other projects in other Chinese provinces where they are going to adopt BOT models and where similar problems may be found.

4.7.3 Reliability

In qualitative research, the reliability often refers to the stability of responses to multiple coders or data sets (Crowther and Lancaster, 2009:80). In this study, reliability should refer to the ‘consistency and replication’ in qualitative research processes. Denscombe (2007:298) explained the ‘reliabilities’ as ‘If someone else did the research would he or she have got the same results and arrived the same conclusions?’ Therefore, in this study, the goal of reliability is to minimise the errors and bias.

To minimise the errors and bias in interviews, the researcher carefully designed research process and procedures. In this way, the researcher follows a certain standardised procedure in every interviews to ensure the reliability (e.g. a standard process of interview includes: consent procedures, greeting, warming questions, as well as the steps of asking questions in depth questions). However, with semi-structured interviews, certain flexibility should be retained, in order to explore the different experiences and opinions of different research participants. In addition, the researcher designed the interview questions explicitly, for reducing misunderstanding of questions, errors and bias as much as possible. During the course of the interviews, the researcher raises the questions explicitly, and carefully listens to what interviewees say without interruption. The bias in the interviews may be minimised in this way. Finally, at the beginning of the data coding process, two pilot codings were conducted with two friends, to identify and avoid potential bias in the subsequent coding processes.

4.8 Conclusion

This chapter has addressed the methodology about this thesis. It presents how it possible to combine both of the quantitative data from the documents and the qualitative data from the multi-means of qualitative methods to study the implementation of Chinese BOT programme in the contexts of motorways and water sectors in China.

The next three chapters present analysis on the data collected from official documents interviews, group discussions and observations (chapter 5 and 6). Then this leads to a discussion of key issues what have been explored and conclusion will be drawn (chapter 7 and 8).

PART FOUR DATA ANALYSIS

Chapter 5 Data Analysis I: an Overview of the Implementation of Built-Operate-Transfer in Chinese Motorway and Water Sectors: The Development and Results

5.1 Introduction

This chapter aims to provide the reader with an overview of the development and implementation of BOT in China's water and motorway sectors. Firstly, the development and implementation of BOT at national level is presented with an analysis on the governmental reports that were collected from the central and provincial governments. Secondly, the BOT development in China's six provinces will be presented. Thirdly, the results of the implementation of BOT in these six provinces are explored and discussed, in terms of the data collected from interviews, a focus group and two non-participant observations. This chapter is an attempt to answer the following questions:

- What BOT projects have already been applied in Chinese motorway and water sectors at central, provincial and city levels?
- How successful have BOTs been applied at provincial and city levels?

Section 5.2 provides an overview of the Chinese motorway BOT market to explore what BOT projects have been applied, where and, to what extent. Section 5.3 reviews the development of the Chinese motorway, water and sewage treatment BOT in the six provinces. This section presents the 96 projects which were studied detailed in field work. Section 5.4 to Section 5.10 explore the BOT's implementation in China's six provinces. From the original objectives of BOT set by the central government, this study will reveal if the application of BOT live up the governments' expectation. A summary will be drawn in 5.11.

5.2 An overview of BOT in China's motorway and water sectors

5.2.1 BOTs in China's motorway and water sectors: an underestimated scale of application

The first question of this study is how many BOTs have been implemented in China? The only accessible database (the World Bank, PPI databases, 2010) has shown 31 motorway BOTs and 303 water and sewage PPP projects were undertaken by private contractors between 2001 and 2009.

However, during the pilot study and the analysis of the government's internal reports, this highlights that the scale of use of BOT in China's motorway and water projects is fairly underestimated. There is piecemeal information have been collected from some central and local authorities. An internal report (Document Code: QU1) from a department of central government indicated that at least 35 motorway BOT contracts had been signed, with 9 provincial and city governments, between 2001 and 2004. Meanwhile, the internal reports gained from *W provincial government* show that at least 24 motorway BOTs had been applied in *W province* in the period 2003-2007.

Contradictory statistics by the World Bank, the central and the provincial governments were also found in the water and sewage BOT sectors. For instance, the World Bank (PPI, 2010) indicates 303 water and sewage PPP projects were undertaken by private contractors between 2001 and 2009. However, an interviewee from the department of the Ministry of Construction noted that the actual number of Chinese BOT and joint-venture contracts in the water and sewage treatment sectors had been over 1100 by the end of 2008. Furthermore, as one internal report from a central department (Document Code: QU3) revealed, 27 provincial authorities reported 273 water supply and sewage treatment BOT applications (not including other forms of PPPs) by the end of 2005.

Therefore, it becomes necessary to present an analysis of the data collected from the government and interviewees in China, to find out how many BOTs have been applied in Chinese motorway and water projects. According to the 8 internal reports collected from China and from three interviewees from central governments, this research highlights that

at least 195 motorway and over 480 water BOTs were developed all over the country in the period 2001-2009.

The three interviewees from the central and provincial governments mentioned that there are some possible factors contributing to these contradictory statistics. First of all, the decentralisation of management and approval on BOT in 2004 led to provincial governments not always report their BOT deals to the central government. Secondly, the boom stage of China's BOT concentrated on the period of 2003-2008, when a large number of BOT contracts reached financial closures. It is possible that the BOT contracts signed by the city councils had not been sent to the provincial and central governments yet. Finally, it is also possible that some city councils actually developed the projects by using a BOT approach with private contractors, but without a BOT contract. These projects were called quasi-BOT projects by a research participant from the central government. Those kinds of projects were often found in small-size water cases. The city councils may not report these projects to the central government excluded them from their statistics.

5.2.2 The implementation of BOTs in motorway and water projects: the regional, economic and industrial difference

Four reports from central governments (Report Codes: QU1, QU2, QU3 and QU4) indicates that some regions and provinces in China attracted much more private capital and developed more BOT projects than others. By analysing this data, it can be seen that the central, eastern and coastal area in China had a large number of BOT projects and introduced much more private capital investment than the western regions. This is because of the rapid economic development, the large population and the large demands on the social and economic infrastructure in these areas, which attracted more BOT investors (QU1). By the end of 2008, the following provinces were the main leaders in Chinese motorway development based on completed length of motorway: Henan, Guangdong, Shandong, Jiangsu, Zhejiang, Hubei and Hebei provinces. These seven provinces' (out of a total of 34) motorways make up nearly 40 per cent of the total completed length in 2006, and had increased to over 50 per cent of the network by 2008 according to the interviewees from the central government. The updated information can be seen in the table 5.1 and a map of China is presented in Diagram 5.2 below.

Table 5.1 The motorway network in China's 30 provinces at the end of 2009 (ranked by length)

Rank	Province	Length (Km)	Rank	Province	Length (Km)
1	Henan	4800	16	Shanxi	1950
2	Shandong	4333	17	Fujian	1895
3	Guangdong	3800	18	Inner Mongolia	1890
4	Jiangsu	3745	19	Gansu	1296
5	Hebei	3304	20	Chongqing	1203
6	Hubei	3282	21	Xinjiang	1075
7	Zhejiang	3110	22	Heilongjiang	1053
8	Liaoning	2758	23	Ningxia	1003
9	Shaanxi	2526	24	Guizhou	975
10	Anhui	2514	25	Jilin	877
11	Yunnan	2429	26	Tianjin	840
12	Jiangxi	2206	27	Beijing	784
13	Sichuan	2190	28	Hainan	660
14	Guangxi	2113	29	Shanghai	578
15	Hunan	1992	30	Qinghai	210

Diagram 5.2 A map of China: 34 provinces and Municipalities



Two interviewees at central government level estimated that the private investments on motorway BOTs were less than 20% of the total motorway investment in China up until the end of 2008. However, in some provinces, such as Guangdong and Henan, motorway BOTs reached a 50% share by project numbers and capital value in 2006 and 2007. More provinces from the central and western China were considering more applications of BOT in their motorway projects.

In contrast with the motorway industry, Chinese water and sewage treatment infrastructure heavily relies on private financing methods (mainly BOTs), which accounted for 60-70% of the total water investment in China in 2005, 2006 and 2007. It is notable that BOTs plus privatisation accounted for nearly 85% of the total number of wastewater treatment projects in 2007.

5.2.3 The BOT in China: increasing demands and the national plans on developing motorway and water services

The analysis of this research also indicates there is huge demand on the motorway and water service in China. Seven interviewees from the central and provincial departments explained that on the one hand, local demands on infrastructure facilities and water service sharply increased in the last ten years. On the other hand, the local governments at provincial and city levels, are apparently in a race with each other in building infrastructure. This competition among local governments contributes to the persistent ‘investment hunger’ visible in China’s economy.

5.2.3.1 Development and implementation of BOT in China’s motorway sector

By the end of 2008, the total length of the Chinese motorway system had reached to 60302 km, which is the second longest motorway network in the world, as the National Bureau of Statistics of China showed (China Year Statistics, 2009). Compared with other developing countries, China has a leading position in developing motorway networks, in terms of total investments and length of motorway. As five interviewees from the central government, W province and Y provinces commented, two national plans for developing the Chinese motorway network have played important roles in the last two decades: They were the ‘5 Horizontal and 7 Vertical National Motorways Plan’ and the ‘7,9,18 National Motorway Network Scheme’ (Ministry of Transport, 2006), see Box 5.3 below.

Box 5.3 China' motorway development plans

In 1990, the State Council of China approved 12 national motorway projects (nearly 35,000 km) to improve the poor Chinese road system at that time. 12 motorways across the country were separately financed and built by 31 provincial governments by the end of 2007. The total length of Chinese motorway completed by 2007 was over 53,600 kilometres. A network composed of five horizontal and seven vertical national motorways was established by the central and local governments.

In 2005, a new plan for improving China's national motorway network (named the '7-9-18 Scheme', 34 projects, 85,000 km) was designed by the Ministry of Transport and approved by the National Development and Reform Commission and the State Council. The '7-9-18 Motorway Network' is to be completed by 2020. Incorporated into and expanding the present National Motorway Network, it will add 85,000 km of high-grade expressways consisting of 7 capital (Beijing) radials, 9 major highways north-south, and 18 east-west corridors.

The '7-9-18 Motorway Network's design goal is: to reach more than 1 billion people in China by connecting all provincial capitals and large cities of more than 500,000 inhabitants with cities of more than 200,000 inhabitants. It is intended that people in eastern areas should have access to an expressway within half an hour, the central provinces within an hour, and the western areas within two hours. In addition, it will improve the communications between economically developed areas, such as the lower Yangtze River Region in central China and the Pearl River Delta in the southeast, and the mid-west and northeast areas. The new motorway network will also enhance connections with western China, and will promote the economic growth of central and south-eastern provinces. Total Investment was estimated at 2,200 billion RMB in 2006: East-China 430 billion RMB, Central China 570 billion and Western China RMB 1200 billion.

Box 5.3 emphasises how China is building a large motorway network. However, it also can be seen that, eastern and central provinces were allocated less funding support from the national government, since the local governments in these regions have stronger financial capabilities than western China. The governments within central and eastern provinces have to raise the motorway funding by themselves and BOT is an important financing mechanism.

However, compared with other developed countries' road systems, Chinese motorways still need to be improved further. When compared with other countries, motorway density in China is still very low, measured in relation to area, see table 5.4 below.

Table 5.4*The Comparison of Density of Motorways for some Developed Countries*

	<i>U.S.A</i>	<i>Germany</i>	<i>UK</i>	<i>China</i>
Total Length (000s Km)	88.7	11.5	3.4	53.6
Density of Motorway (Km/ 00s km ²)	1.75	2.22	0.8	0.56

Source: Ministry of Transport, 2006

The biggest challenge for China's road and motorway construction is the shortage of public funding, since they have been mainly funded by local governments with local budgets or financial resources rather than by central government. Investments using central budgets and grants only covered about 15% of China's motorway investments from 2002 to 2007 (interviewee U from the central government). Therefore, a number of provinces, attempted to raise motorway investments from the market, such as BOTs, bank debts financing and the capital market. Motorway infrastructure in Henan and Guangdong largely relied on BOTs, which had a share of over 45% of the total motorway investment in these two provinces during the period of 2002 to 2007. Motorway BOTs in Guangdong province had reached a 50% share by investment value in 2005. Motorway BOTs in He'nan province also kept a 48% share in terms of the number of the motorway projects since 2003. The experience of Henan province concerning motorway finance were strongly advocated by the Ministry of Transportation and Ministry of Construction of China (2007). As a central province in China, without a good economic base and specific policy support from central government, the total length of He'nan's motorways increased from 1,231 km in 2003 to 4,500 km by the end of 2007, a sum of 50 billion RMB was raised by BOTs in He'nan province up to 2007. This is the longest section of motorway network in the 34 Chinese provinces and regions. The experience of He'nan is deemed more transferable by other central and western provinces in China, whose situations are similar to those in He'nan. Si'chuan, Shaan'xi, Shan'xi, Hu'nan and Hu'bei provinces are planning to build more BOT motorway projects in the near future. Furthermore, Guangdong is another pioneer of applying BOTs in road, water and power generation projects. As discussed in the chapter 2,

most of the earliest BOTs in China were located in this province. However, due to Guangdong's good economic base and the special national policies' support, e.g. Special Economic Zones, the development of BOTs in Guangdong is 'excellent, but not as impressive than Henan' (An interviewee from the central governments). However, Guangdong's experience and pilot projects of BOTs have had also fairly informed another 19 provinces in central and eastern China.

5.2.3.2 Development and implementation of BOTs in China's water sector

The huge population, economic growth, urbanization challenges and ongoing environmental issues in China have significantly increased the demands for water and sewage services. In response, a large amount of public finance has been invested in the water industries since 1992. In the 21st century, the state wanted to promote its new ideologies, which aimed to fulfill the increasing demands of the Chinese people on public services and at the same time build an environmentally friendly society. The government believed China should build a 'sustainable' development model, in order to minimize damage on the environment. The water sector, including the developing sewage industry, is a major part of China's development strategy. In 2002, the State Council, the National Development and Reform Committee, Ministry of Environmental Protection, Ministry of Construction, and Ministry of Water Resources jointly published policy and compulsory requirements on local waste water treatment. Cities with a population over 300,000 had to build their own waste water processing plant before 2008 (an interviewee from the provincial government). At the same time, the government wanted to make the state-controlled water sector 'more efficient through a series of reforms', involving:

- 'restructuring and incorporation of the public water utilities',
- 'reforming public utilities' investment systems',
- 'adjusting the laws, regulations and governance'
- and finally by encouraging various forms of private participation in the water sector.

Water consumption has increased with further urbanization and industrialization in the last ten years, and is expected to continue to increase as the economy grows. By the end of 2030, urban industrial water consumption is projected to increase from the current 100

billion tons per year to 200 billion tons. Urban and rural residential water consumption is projected to increase from the current 50 billion tons to 110 billion tons, as the Ministry of Construction estimated (2007). There are many new factors influencing the growth and changes in China's water and water treatment market. They include, but are not exclusive to,

- changes in environmental regulations and their increased enforcement,
- increased priority given to water projects by governments,
- international financial organisations' lending,
- a move to market pricing for water, changes in water project financing
- and a growing awareness and public concern related to water pollution.

However, the most important question is where will all the funding come from? The report from the central government (Document Code QU4) explored that in the 17 Chinese provinces, local demand for water supply and sewage treatment services are extremely high, while the coverage rate of water supply and sewage treatment networks at county and township levels are extremely low. This is because only 30% of local population in these places are able to use tap water in 2007. The in-depth studies in 7 counties in a central province revealed in further that none of these counties had built sewage treatment facilities and pipelines by the end of 2006. By considering the external contexts and practical barriers of developing water projects in these counties, the government (QU4) recommended that BOTs would be a major and feasible way to develop water and sewage treatment projects in China's small counties, since other financing could not be possibly obtained in the short-term.

The investigation from the central government (Document Code QU3) presented that BOT's implementation covered all regions of China, but were concentrated in the eastern and central provinces. From 2002, 80% of 1075 newly developed water supply and sewage treatment plants were developed by private capital investments, and nearly 500 projects were built using BOT model.

5.3 The BOTs involved in this study

By narrowing down the research questions and scale, this study focused on 94 BOT projects from information obtained from 8 government reports and with 21 interviews in China's six provinces. The interviewees gave their answers and opinions based on the BOT projects on which they had worked or were involved in. These covered different industries, but were mainly focused on the motorway and water sectors. These projects included 54 water and sewage treatment BOTs, 26 motorway BOTs, 4 rubbish treatment BOTs (DBFOs), 4 urban river bridges BOTs, 2 power station BOTs, 1 underground BOT, 2 urban river tunnel BOTs, and a Sport Facility PPP project (See Table 5.5) . Almost these projects have been built in six provinces and 10 cities where the research was conducted.

Table 5.5 BOT Projects: Industries, Values, Locations, Project Quantities, Locations, and the interviewees Involved

Industries	Projects' capital investments (million RMB)*	BOT Projects Numbers	BOT Projects Locations	The interviewees code
Water/Sewage Treatment	1185	32 (1 Joint-venture)	W Province	Interviewee A, B,D, F, P
		18	Y province	Interviewee B and M
		3 (1 joint-venture)	V province	Interviewee T, Q and R
		1	U province	Interviewee K
Motorway	121,700	19	W Province	Interviewee N, A
		4	Y province	Interviewee B
		2	V province	Interviewee Q and R

		2	X province	Interview V
Rubbish procession	80	1	Y Province	Interviewee M
		3	W Province	Interviewee A, B and G
Bridge	550	3	Y Province	Interviewee M
		1	W Province	
Power stations	300	2	W province	Interviewee A and F
Underground	--	1 (PPP)	U province	Interviewees K and L
Tunnels	--	2	V province	Interviewee Q and R
Sports	--	1(PPP)	U province	Interviewees K and L

** In October, 2007, 1 British Pound=15 Chinese Yuans (RMBs); However, in October 2010, 1 British pound=10.18 Chinese Yuans (RMBs). This has caused problems on exactly valuing these projects in British Pounds (Sterling). Furthermore, the exchange rate is still changeable. Therefore, the RMB has been chosen as the currency unit to measure these projects' value rather than changing them to British pounds or US dollars.*

*** The interview with the director of key and large project management office at W Provincial Development and Reform Committee. This director is in charge of all W province's water and waste water treatment project construction and operation. Discussions here are about 32 BOT water projects at city level rather than county level in W province.*

**** Value accounted for 19 BOT projects, with 26 highway projects from W Province.*

The majority of these projects were put into operation on or before 2008, except for 15 still in the construction phase. Furthermore, there are 12 of 96 BOT projects that had been put into operation before 2000, see table 5.6 on next page.

Meanwhile, it was noticed that all 87 motorway and water BOT projects were managed and implemented by the local transport, urban management and urban investment and development departments at city level. However, these BOT projects also had to be approved or reviewed by provincial governments, such as the Provincial Development and Reform Commission, Provincial Transport Departments, Provincial Construction Departments.

Table 5.6 The BOT projects in order of commenced operations dates

Year commenced operation	Number of Projects	Numbers of projects by Sectors
2008 towards	15 (10 contracts were cancelled by the governments in 2008)	Motorway (4) Water supply (2) Sewage (8) Tunnel (1)
2001-2008	69	Motorway (23) Water supply & Sewage (38) Rubbish Processing Facilities (4) Bridges (1) Underground (1) Sport (1)
1995-2000	12	Water supply and Sewage (8) Urban Bridges (3) Urban Tunnels (1)

In terms of capital value, the BOT projects involved in this study cover a wide range. All motorway BOT projects' investment can be classified as 'large projects' as defined by the central government, since the capitals investments are over RMB 200 million (or US\$30 million). However, over half of water and sewage treatment BOT (TOT) projects can be classified as small projects, since their capital value was lower than RMB 200 million, and the daily processing capabilities were lower than 80,000 tons per day, see table 5.7.

Table 5.7 The Size and Capital Values of the BOT projects

BOT Project Size and Capital Value	No. of Projects	Sectors
Large and Medium BOT Projects with a capital value over RMB 200 million (or US\$ about 30 million)	27	Motorway BOT
	17	Water Supply and Sewage
	4	Treatment
	2	Urban/Cross-river Bridges Cross-river Tunnels
Small BOT projects where investments under RMB 200 million (or US\$ 30 million)	37	Water Supply and Sewage Treatment

The analysis from the local government's reports shows that BOTs have been widely applied in developing local motorway and water infrastructure in the six provinces where the interviews carried out. However, W province is an extreme case in the implementation of BOTs. The provincial and city's governments in the W province attempted to use BOTs finances motorway and water infrastructure as much as possible. As the data collected from the W province showed, in terms of the number of projects over 30% of motorway and 60% of water infrastructure were built, financed and operated by private contractors. Through applying BOTs in motorway and water infrastructure: 18 private BOT contractors have operated and maintained 1800 kilometre of motorway so far. Meanwhile, 109 (including 75 BOTs and joint-ventures) sewage treatment plants have been built in all 108 cities and counties, serving over 40 million people in W province by the end of 2007. Furthermore, based on previous experience on implementation of BOT, W province urged all motorway BOTs to adopt the standard contract model designed by the International Federation of Consulting Engineers (FIDIC contract). However, this study also looked at the negative effects of using BOTs were by reviewing the internal reports in the six provinces.

5.4 Have BOTs in Chinese motorway and road sector lived up to the governments' expectations

The empirical results of this study reveal that the use of BOTs in China's motorway and water sectors was fairly under-estimated by previous studies and reports. However, through the interviews and investigations in the six provinces of eastern and central China, this study found that the problems and difficulties of applying BOTs in China's motorway and water projects was also under-estimated by the previous research.

Firstly, the outcome, performance and results of the implementation of BOTs was not the same as the government claimed and previous studies suggested (for instance, the World Bank, 2003, Qin and Yu, 2005, etc.), despite this the positive results and benefits of using BOTs were significant in some cases and locations.

Secondly, practical difficulties of applying BOTs in China's motorway and water sectors was caused by not only the poor design mechanisms of BOT programmes, but was also deeply affected by China's rigid and under-developed public and private industries. Finally, the primary investigation showed that more challenges had been raised by specific Chinese environments and circumstances, e.g. political, economic, cultural and social factors. In the following sections, two questions needed to be studied: has BOT in practice borne official claims and fulfilled official expectations? And, what practical difficulties have assessed or have been encountered in the BOT process. This study examines whether the implementation of the BOT programme in China's motorway and water sectors fulfills the official objectives to help learn lessons. These included:

- Have BOTs brought private investments into China's motorway and water infrastructure projects, increasing the availability of local public infrastructure funding?
- Have BOTs accelerated the development of the local motorway and water infrastructure at provincial and city levels?
- Has the monopoly of the state in the motorway and water sectors been broken, now that new suppliers have been introduced?
- Has competition and efficiency in these industries been strengthened and improved by introducing private competitors/service suppliers when using BOTs?

- Has the investment decision-making on developing local motorway and water industries been improved as the government stated by applying BOT models?
- Finally, has the infrastructure developed by BOT models ultimately improved living conditions of the local residents, fulfilling the local demands for public services and creating more job opportunities for the local markets?
- and have new technologies and technical innovations been introduced as a result?

5.5 Have motorway and water BOTs improved the availability of finance for public infrastructure?

Seven local decision-makers were interviewed, such as provincial governors' assistants, city's mayors, vice-mayors and leaders of local Development and Reform Committees. They believed that BOTs do have an important role and effect on improving public financial shortages and boosting local motorway and water infrastructure development in the short term.

5.5.1 Shortages of local public funding in the motorway and water sectors: the use of BOTs for 'extra extra-budget financing'

In this study, almost all interviewees from local authorities (at provincial and city levels) complained that the local government in China had inadequate revenue for meeting the heavy expenditure responsibilities to develop motorway and water infrastructure projects. Indeed, the biggest challenge for developing infrastructure and services in China was the availability of public finance at city level. The local public financial shortage is a serious problem that has not been solved since the 1994 reform and restructure of China's fiscal and taxation systems. As shown in chapter 2 and in interviews with officials from the six provincial governments, Chinese local authorities at city levels only received 40 percent of the taxation revenue in 2008, while having to budget for nearly 80 percent of public expenditure. As a director from the financial department of a city council, commented,

'... Insufficient public finance and budget is a common issue for Chinese city and county councils. The survey done by the Ministry of Finance showed over one

thousand county councils (over 50% of the county councils in China) were unable to pay their staff on time in 2003...'

The interviewees from local authorities and local financial departments at city level pointed out that current local budget finance and funding just covers the basic expenditures for city council operations, local education expenses and local pension's schemes. If local authorities did not increase their revenues from other sources, it would be impossible for them to develop and finance local infrastructure and public services. Additionally, the sources of local public revenue are very limited, since all tax bases, rates and categories are tightly controlled by central government. Furthermore, under China's public accounting and budgeting regulations, local governments were not allowed to borrow money from commercial organisations and banks, except when the Ministry of Finance agreed. In China, Government and public service units implement a special accounting system, called *Public Administration and Public Services Units Accounting and Budgeting Standards*, which largely differed from *Chinese Enterprises Accounting Standards* (based upon *International Financial Reporting Standards*). There should also be no 'deficits' in the local authorities' post-budget and financial reports. This meant that China's local authorities were receiving insufficient finances from their share of tax revenues, and were not allowed to raise finances through borrowing or debt. Under this circumstance, BOTs and extra-budget finances were introduced, and made available to local public finances. Extra-budget activity (expenditure or revenue) refers to 'sets of government transactions that are not included in the annual budget presentation. These may not be subject to the same level of scrutiny or accounting standards as the annual budget' (IMF, 2007).

'...local government had many attempts to gain capital [from] delivering local infrastructure and public services developments, such as raising capital from selling local public land to property developers, and establishing local urban investment (or development) companies. These were controlled by local authorities, and would attract varied social investments and finally there were BOTs.'

Mr. Z, an investment manager from a local urban development company

As a director from the government pointed out, the biggest portion (about 50%) of local extra-budget financing revenue is the revenue raised from selling local public land to commercial property developers. This is often called ‘Land Financing’ in China. Land financing is not included in the annual budget presentation. However the land financing at city level has to be put into a separate account to be scrutinized by the provincial and national government. Due to public land being limited in local regions and not sustainable, the local governments at city level cannot entirely rely on land financing. Therefore, city governments need to raise capital funding from other sources.

BOT is another way to raise local infrastructure financing. BOT is not included in the budgetary reports of local governments, therefore it is an extra-budgetary finance. However, BOT is not put into a separate account by local governments either, and so it becomes an extra extra-budget finance, which is totally unscrutinized by the provincial and central governments. BOT has no clear definition in terms of accounting standards, due to the obsolescence of China’s public accounting and budgeting regulations, which did not address these problems at all.

By creating diverse ‘extra-budgets’ financing and accounting methods, local authorities avoided breaking Chinese government accounting and budgeting regulations, raising considerable capital. A substantial amount of debts were borrowed from various local government-controlled businesses (so-called, Local Government Financing Vehicles) and banks. The four decision-makers from W province, Y province and S province stated that extra-budget finances and BOTs allowed local authorities to improve the local financial situation in the short term, but in the long term it would damage the stability and safety of local public finances. These four interviewees from both central and provincial government believed these BOTs and Local Government Financing Vehicles were time-bombs in the Chinese fiscal system. A governor’s assistant (director at vice-governor level) of W provincial government and two interviewees who working in the banks revealed, the use of local extra-budget financing has already been

‘out of the control of the central government... it is not clear and it is difficult to estimate what the scale and scope of extra-budget finances are at local level.’

However, as a vice-mayor and several decision-makers worked in different city councils responsible for urban infrastructure and management pointed out, if the government at provincial and city levels stopped using land financing, BOTs and local government financing vehicles immediately, they would not be able to find alternative funding or financial sources. The vice-mayor from the K city of W province also stated further that,

‘as I know, the local decision-makers in other city councils are also faced with the same financing issues. We clearly understand the potential drawbacks and problems of extra-budget financing and borrowing in the future. However, we have to use them since we have so few choices.’

Pilot Study Interviewee 5, A vice-mayor

5.5.2 Applying BOTs in motorway and water projects: increasing the finance available to local government

By considering BOTs as an extra extra-budget finance, the officials from eight different city governments explained that BOT arrangements allowed the public sector to consider otherwise unaffordable projects. From this perspective, BOTs help to fill the so-called infrastructure gap between what the government can afford and what local people need. Thus,

‘...BOTs allow the local public sector to achieve more financial resources by using the private sector in the short term. This has enabled the local government to allocate limited public financial resources to worthy projects...’

Pilot Study Interviewee 4, A general director of Mayor Office

BOTs were introduced as one of the extra-budget finance and a complementary option to develop public infrastructure and service in local areas when public finances were not available or inadequate.

‘Financing capabilities and the situation of local authorities have had a significant effect on introducing and implementing BOTs. The local councils [that] have [a] big fiscal deficit or debt crisis with heavy financial burdens are more likely to introduce

and adopt BOTs’.

the focus group in the Urban Development and Investment Company

The findings also revealed that the local officers were forced to raise a large sum to self-finance the development of motorways, the construction of the water supply infrastructure and improvements in sewage treatment services, without central financial support. China’s city and county councils were compulsorily told to build sewage treatment factories in every city and town by implementing the ‘environmental strategies’ of central government, while the largest portion of the funding needed to be collected by the local authorities. In this study, almost all of the local officials, from ‘rich’ and ‘poor’ provinces alike, complained about the shortage in local fiscal budgets for developing motorway and water infrastructure projects.

‘The local governments must meet the needs of financing local infrastructure and public services, while we have to ensure that we have adequate resources to do that.’

Pilot Study Interviewee 4, A general director of Mayor Office in the K city, W province

5.5.3 BOT accelerates the development of local infrastructure—evidence from W, Y and V provinces

The evidence from the six provinces showed the ten city councils have raised a large amount of investment capital through BOTs. Without private contractor and investor’ participation, these projects could not be constructed and operated in such a short period. As Mr. P who is working in the transportation department of W province estimated that,

‘without BOTs, and if (the government) just relied on the public investments, loans and funding, these 19 motorway projects might have been postponed for 5 to 10 years...BOT is the available and easiest way to develop motorway projects at present’

a leader of the Transport Department at provincial level

As Mr. P stated in 2008, the current public funding and, the MOT revenue and operating expenditures on the W provincial motorways, can only cover the maintenance works and salary of the staff of the transport department. By introducing private capital, the

governments in W province were able to complete the motorway networks originally planned to be finished in 2015.

The empirical findings from Y province and V province also presents BOT as an important approach to financing local transport infrastructure projects. In V province, two BOT cross-river tunnels had been financed, constructed and operated by the contractors in 1995 and 2009, which largely improved V province's urban road and transport system. Meanwhile, in WU city, the capital of Y province, three cross-river BOT urban bridges had been financed, built and operated by private contractors from Hong Kong in 1995, 1997 and 1999. The interviewees from Y and V provinces stated that the BOTs had brought a significant amount of capital investment to local infrastructure projects.

5.5.4 The Difficulties of Attracting Private Investment: the Application of BOTs in Small Water and Sewage Treatment BOTs

The empirical findings from the six provinces showed that not all BOT projects are attractive to private investors and contractors. This is true of the small water supply and sewage treatment projects with a capital value under RMB 200 million. These small projects usually are less-attractive to the large or multinational BOT contractors, as the interviewees from the Ministry of Construction stated.

Firstly, the profitability of small BOT project is not high, but transaction costs and operating costs often are similar to those of medium size BOT projects, as Mr. U commented. Mr. U and Mr. K stated that the investigation by the Ministry of Construction showed, in some super-large sewage treatment and water BOT projects in V province (daily treatment capacity over 1.4 million tons/day), the average/unit treatment cost is just RMB 0.23-0.35/ton (2-3 pence/ton) (an interviewee from V province). However, for medium-size sewage treatment BOT project in W province (over 100,000 tons/per day), the unit cost is about RMB 0.4-0.65/ton (data taken from the on-site observations in 2008, given the facility operated at its full design capacity). Therefore, small-size sewage treatment BOT projects have relatively higher transaction and operating costs, while the profitability is lower due to their smaller scale. The data from the six provinces showed over two-thirds (37 of 54) of sewage treatment BOTs involved in this study are small projects, with an

average daily processing capacity of only 35,000-40,000 ton/day. This created difficulties in attracting BOT contractors to the water sector.

Secondly, although China's domestic investors are actively participating in these small sewage treatment BOT projects, the financial, managerial and technical capabilities of the Chinese BOT contractors are in doubt. At least 17 small sewage treatment BOT contracts had been terminated by the government in W province and Y province, after the private contractors met a series of financial and operational problems. These will be addressed in a later chapter.

5.5.5 Motorway and Water BOTs were undertaken by state-controlled businesses: should this be a Public-Private Partnership or Public-Public Partnership

When reviewing all BOT projects involved in this thesis, it was found that the contractors of 5 Motorway, 5 Water and Sewage Treatment, 2 Tunnel BOTs and 1 underground PPP were not private businesses or companies, but rather government-owned/controlled businesses.

In the five Motorway BOT projects in W province, two government-controlled publicly listed companies were project contractors. Three governments controlled Plcs had undertaken five water supply and sewage treatment BOT contracts in V, W and Y provinces. In addition, a government-controlled Tunnel Construction Plc won two Tunnel BOT (TOT) contracts in V province. Finally, Hong Kong Underground Plc as a government-controlled company defeated other bidders from Germany, Canada and Singapore, to win an underground PPP project in U province.

The interviewees from the local procuring authorities stated they do not mind if the contractors are 'government-controlled' or privately-owned. The key criteria for selecting the BOT bidders are their overall capabilities in designing, financing, constructing and managing the infrastructure projects. The interviewees from the W, Y and V provinces showed that the government-controlled BOT contractors have distinct advantages in financing and managing super-large infrastructure projects, such as strong financing and technical capabilities, and wide experiences on developing large motorway and water projects. However, some private BOT contractors complained that the competitions

between private investors and state-controlled businesses was not fair, since the latter could get more financial supports from the state-owned banks, the central and local governments. A director from the Department of Transportation in a provincial government commented that there no regulation mentioned that the state-controlled businesses cannot join the BOT bidding. The procuring authority would like to see that state-controlled businesses and private contractors compete against each other under the BOT framework. He also stated that the state-controlled companies did not always win BOT contracts in the competitive bidding, as witnessed from the motorway projects in W province.

5.6 BOTs in Chinese Motorway and Water sectors: monopoly, competition and the diversifying investment strategy

All interviewees from the central and local authorities believed that competition was essential for the success of the application of BOTs in both motorway and water projects. As the government claimed, through introducing private investment capital into China's motorway and water projects, the central and local governments in China expected to diversify their public investment' sources and options (areas that had been solely dominated by them or public-owned enterprise), indirectly improving the operational efficiencies of public services. Using privately financed infrastructure and utility projects, the government claimed that private investments could break the monopoly of the government in these sectors, introducing multiple and diverse ownership suppliers in these markets. The results of interviews with the decision-makers working in the Ministry of Construction, National Development and Reform Commission and Ministry of Transportation showed the central and provincial governments was that they tried to adopt the 'pro-market', 'pro-competition' and 'pro-efficiency' strategies when developing motorway and water infrastructure projects in the last ten years.

5.6.1 Encouraging competition in China's motorway and water BOTs: the official strategy and approach

As the interviewees from central government stated, the first step in encouraging

competition in China's BOT market was to introduce new competitors into the market. In 2001, Chinese domestic investors were allowed and encouraged into the water, motorway and power generation BOT markets which used to only be open to Hong Kong or international investors.

In this way, we hoped to increase the numbers of suppliers/contractors for the motorway and water BOT market; and at the same time, we also expected the new entrants to the BOT market to re-shape the motorway and water market structure which at that time was dominated by a small number of Hong Kong, French and British contractors.

A manager from the NDRC at provincial level

The second step to enhancing competition in China's BOT market was to decentralise the BOT approvals and reviews from the National Development and Reform Commission to 32 provincial Development and Reform Commissions in 2005. Through this management decentralisation, the times and costs of obtaining approval on BOT project applications had been greatly reduced. The procedures of approval had been simplified.

In practice, the decentralisation (on BOT approval and review) largely reduce the approval costs and speed up the decision-making processes.

A manager from the NDRC at provincial level

Finally, competition was also introduced with the adoption of a competitive bidding approach in the BOT tendering and procurement processes, as Mr. P and Mr. A suggested. However, the interviewees from central government pointed out that (compulsory) competitive bidding had been widely applied in conventional publicly funded projects all over the country. Competitive bidding is not a compulsory requirement for all BOTs, because this kind of bidding is expensive for medium and small size projects, although the central government did advocate it.

The interviewees from the public procuring authorities in W, U, Y and V province confirmed that in the 14 motorway, 10 large size water BOT projects and 10 small sewage treatment BOTs, compulsory competitive bidding had been applied. However, in some

cases, the small size projects failed to attract sufficient bidders (at least 3), thereby one-to-one non-competitive negotiations were allowed.

5.6.2 Increasing the number of BOT contractors and changes to the BOT market structure: evidence from W and Y provinces

The evidence from W and Y provinces showed, that the number of BOT contractors had grown rapidly since 2001 when China's BOT market was opened to domestic investors. At same time, in the motorway and urban transport BOT markets, Chinese domestic investors had already achieved the majority share, which used to be dominated by Hong Kong private infrastructure contractors.

The examples from W province showed, before 2000, the provincial transportation department and highways agency were responsible for designing, financing, constructing and operating all roads and motorways. During the period of 2001-2008, about 26 private motorway contractors had been introduced, managing 19 BOT projects in W province, 23 contractors were from different provinces and regions of mainland of China, with 3 contractors from Hong Kong. Interviewees from Y, V and X provinces also verified that the Chinese domestic investors had a dominant position in their motorway, bridge and tunnel BOT markets in 2008. However, motorway BOT projects in China were still restricted to international contractors.

Although the water supply and sewage treatment markets have been open to foreign investors from as early as 1995, the number of Chinese domestic contractors grew very fast during the period 2002-2009. However, the data collected from the six provinces and the reports from the Ministry of Construction revealed that Chinese domestic BOT contractors mainly concentrated on the small size water BOTs, depending on their financial and technical capabilities. The large and medium size BOT contracts were normally won by the foreign investors from France, the UK and Singapore. Two French water multinational companies especially have continuously expanded their share of the networks in Chinese water supply and sewage treatment BOT markets in the last two decades. These two French water companies have a small share of the market, in terms of the number of BOT projects, but the big water BOT projects in China's large and medium cities were often

controlled by these French companies. The information gathered from the six provinces showed that a small number of multi-national companies had obtained a more concentrated share (over 10%) of China's water market over the last five years.

5.6.3 Weak competition in the bidding phase of BOTs

By reviewing the process of procurement and by discussions with the participants, it can be shown that the level of competition in many Chinese BOTs was often weak. However the degree of competition in the BOT procurement and bidding stages differed, depending on the industry (motorway or water) and the tendering mechanisms implemented (competitive or non-competitive). Most unsuccessful BOT projects (cancelled projects or the expensive BOT contracts) often were let out without competitive biddings.

As the participants revealed, most problems came from water and sewage treatment BOT procurements with the local councils receiving very few expressions of interest in response to their initial advertisement for the procurement. Nine out of the forty-five water BOT projects had experienced problems in the procurement phase because too few investors showed sufficient interest. In five cases, competitive bidding had been adopted initially and a few of the bidders entered into the second round of bidding but then quickly withdrew leaving no bidders for these procurements. A director explained that:

'... we tried to create stronger competition in the procurements by using competitive bidding... the lessons showed that the bidding costs and risks were higher in this kind of bidding to the potential bidders, specially for the small and medium size BOT projects...'

A Vice-Director of provincial Development and Reform Committee

As mentioned by the research participants, in the earlier water BOTs projects, the central government required all projects to adopt competitive bidding for the procurement of BOTs in 2002. However, the high bidding costs for both the procuring authorities and private investors in the water projects, forced the central government to change its attitude. And as a consequence, non-competitive negotiations were allowed. In thirty-two of the forty-five

water BOTs interviewed such negotiations were conducted with a single investor. A non-competitive negotiation to expand a contract would not be regarded as the best route to achieve competition and value for money in BOTs. The directors and managers that have participated in these negotiations commented that:

‘...we clearly understand the disadvantages of non-competitive negotiation in BOTs, these negotiations have a low degree of openness and transparency, [easily] producing corruption and ‘under the table deals’, past experiences confirmed that ... also, local councils were often at a disadvantage in these negotiations, due to their poor negotiating skills and capabilities. The key output specifications and the requirements for private contractors were often compromised in this process, like risk allocations, pricing equations and some responsibilities...’

A manager, the city’s Urban Management Department

Through non-competitive negotiations, the local authorities procured and contracted out the projects to private contractors. However more trouble occurred during later operational phases, such as the contractors being unable to deliver satisfactory performance and outputs, plus conflicts caused by poor risk allocations and opportunism, which occurred on both sides of the BOTs. The experiences from this practice showed that:

‘In many cases, the contractors [who were successful in] non-competitive negotiations [found it] easy to form a monopoly position in the local markets and get excessive profits...’

Mr. L, the regional managers, a policy bank of China

Competitive bidding is more likely to be successful in selling the major stocks of publicly-owned water companies and in the motorway BOT projects. Stronger competition was found in the procurement when bidding for the major stocks of public-owned water supply facilities and motorway BOT projects. These projects normally had fewer risks and higher returns.

‘...joint-venture (or joint-stock) model based water projects with the governments have lower risks because the local governments and the contractors share the revenues and risks; they work on the same side... The profitability of the motorways was usually good and the cash flow of the motorway BOT projects is stable in many cases... the projects with lower risk and higher return always are the favourites of investors. Therefore, it is not surprising that there is stronger competition during these BOTs’ procurement ...’

A manager, from a Motorway Investment Company

Finally, in the whole of China’s BOT market, especially for the water and sewage treatment sections, there is a trend for a small number of private investors to dominate the market. The interviewees had noticed that:

‘...two French companies always won the bidding and got the contracts for the procurement. They already held and controlled nearly seventy cities’ water supply markets in China. These less-competitive and monopolistic signs have already been noticed by the central government...’

A Director, Ministry of Construction

5.6.4 Regional Monopoly of Motorway and Water BOTs in China: Exclusivity of BOT Contracts and Weak Competitions at Post-contract phases

Most of the interviewees believed that public bidding is an effective, transparent and fair way to select the appropriate investor or operator. However, as discussed in the last section, about two-thirds of water supply and sewage treatment projects had adopted non-competitive negotiations rather than compulsory competitive bidding. About half the number of Motorway BOTs investigated in this study applied competitive bidding in their procurement and tendering processes. Although very successful/strong competitive bids have been observed in 7 motorway and large water BOT cases, the overall extent of such

competition in China's BOTs is weak.

Furthermore, one notable point was raised by an official from the Ministry of Construction in his interview, which is that in most motorway and water BOTs,

'the BOT bidders competed for [monopolizing] the [local] market rather than [several suppliers competed] in the market... it is like a game of the winner takes all... The competitions are strong before the contracts have been awarded in some cases. But, when the BOT contract has been signed by the government, the private contractors gain a monopoly position in the local market'

Mr. K, a director from the Ministry of Construction

Two interviewees from local authorities who worked in the front-lines argued that the water supply and sewage treatment industries featured had a natural monopoly and huge costs for pipeline networks construction. Strong competitions were therefore difficult to create in practice. It is an inevitable result that the private contractor has a monopoly position in the local market. Mr. A who was from the local Development and Reform Commission commented, 1 water supply and 2 sewage treatment BOT projects have been built and operated by three different private contractors in K city of W province in 2007. However, there is no competition between them at all, due to the fact that these three BOT contractors provide services for three different districts of the city.

Finally, primary studies of China's BOT contracts discovered, that almost all of the BOT contracts, granted exclusive and monopoly powers to the private contractors over the contract period of 20-30 years. In this way, the profitability of the BOT contractors had been secured, but it was also clear that the competition had been prevented.

5.7 Have BOTs improved the constructional and operational efficiencies of Motorway and Water Projects

5.7.1 Debates on inefficiencies in the public sector and criticisms on publicly funded motorway and water projects

14 of the interviewees from local authorities and research agencies believed that BOTs

were adopted in Chinese motorway and water sectors, due to the reforms of the Chinese public investment system and public service SOEs. The government wanted to try out a new approach in providing public services and the development of the public infrastructure.

‘...the obsolete Chinese traditional models for developing, operating, provisioning and managing public services, which followed the command economic system, were not feasible and capable of developing some infrastructure industries. BOTs are an innovative way and market-emphasised approach that could be used to solve the local public financial problems, and improve efficiencies by transferring private business’ practices.’

A governor assistant, at the provincial council

In the focus group, a director working in a local council mentioned that, based upon past experience, a substantial portion of China’s economic resources are devoted to these public agencies and SOEs, while their outputs and performance were really poor. In the past, the government at central and local levels have made large additional funds available to public infrastructure and services industries in the hope of building new infrastructure and improving public services.

However, the evidence provided by the interviewees on publicly funded highways and water projects showed many signs that pointed to these additional resources being increasingly captured and used by their related public agencies and SOEs to increase employment and wages rather than for their investment in the public infrastructure and services. As a deputy-mayor complained:

‘The city councils want to develop more public projects and improve public services in local areas and we have put a large amount of financial and technical resources into these industries. However, public service SOEs and departments always paid more attention to increasing employment, improving working environments (luxury offices and company cars, even built the hotels) and personal benefits (like, basic wages, pensions, health schemes, bonuses and national insurances). In some cases, the very

large departments were built for themselves'

a Vice-Mayor from a city council

'... in many cases, when local departments and SOEs received infrastructure funds from central or provincial government, the first thing they did was to pay back previous debts, such as unpaid staff salaries, pensions, health allowances etc., the second, was to build offices and buy new company cars and finally, the rest of the funds would be invested in the new public projects'

A vice-director, the city's Development and Reform Committee, city level.

Only a small portion of public funding was invested to develop public projects and improve the quality of public services, this phenomenon is especially significant and popular at the lower levels of government, like city and county levels.

'...two popular problems with China's local public service SOEs and quasi-agencies are their over-staffing and self-interest... leading to inefficient investment results. The government put scarce resources into public services but would not get [the] good results that they wanted. Of course, this [is] largely caused by some historic and old command economic reasons... '

Pilot Study PL3, at provincial council.

The publicly funded projects are often subject to cost overruns, delays, poor operation and management and staffed with rude customer service operatives. The public sector took up a large quantity of public resources yet had poor outputs and performance. Some decision-makers at local level interviewed showed that they had lost confidence and patience on reforming the infrastructure SOEs:

'Under [the] current system, even though more resources are put into SOEs and public service' businesses, the government finds it difficult to achieve the objectives they wanted.'

5.7.2 The quality and efficiency of publicly funded projects and BOTs

Evidence from the government's documents (QU5-QU10) and responses of interviews from W and Y provinces showed that the publicly funded motorway and water projects had serious problems in their construction, operation and financial management. In the cases of motorways and urban bridges in W and Y provinces, the quality of a number of them is really poor. The quality inspections in 2004 conducted by W provincial Transportation Department and the W provincial People's Congress discovered, nearly 25% (7 in 28) of the government-funded motorway projects had very serious quality problems. In a city, the capital of Y province, the city council conducted a quality and safety inspection on 10 cross-river bridges (including 3 BOTs) in 2006. The results revealed 9 of them had some quality and safety problems. In 3 of the publicly-funded projects developed in the past five years these quality issues were fairly serious. The exception was one mega bridge built in the 1950s, it still maintained the best quality conditions and standards. The comment in the inspection report said this bridge (built in the 1950s) is able to be used for another fifty years. The quality of the three BOT bridges was good and above average in terms of China's technical standards, from the results of these inspections.

In contrast to the publicly funded motorway projects, the government-sponsored water and sewage treatment projects involved more operational matters. The investigation by the Ministry of Construction in 2007 showed, about 60% of the 300 conventional publicly funded sewage treatment projects were not operating to capacity. This was due to the sewage treatment pipeline networks in the local areas not being developed and completed by the local governments.

Finally, several managers from local public service SOEs argued that inefficiencies in public institutions or enterprises resulted from distortions caused by government intervention in SOEs as well as the government's organizational structures, which were typically highly bureaucratic.

‘... directors and managers in SOEs are directly appointed by local government... these staff were usually treated the same as government officials...’

A regional manager, the National Development Bank of China.

“Public service SOEs are not purely commercial businesses. They often suffer [because of] political decisions, public interest and public benefits. Therefore, we cannot fully operate the business by following the market rules. Does the government allow water SOEs freely to decide [the] prices of public services? No, it is impossible...”

A manager, the city’s Urban Management Department.

There are arguments on the inefficiency of SOEs and many officials in local and central government believed that BOTs are necessary to allow them to respond to market forces, becoming more competitive and finally improving efficiency.

5.7.3 Construction Performances of Motorway and Water BOT projects

5.7.3.1 Construction performance of BOT motorways: the evidence from W province

The empirical findings on construction performance of motorway BOTs indicated they are not as good as the government and the officials expected, in terms of time for construction, construction quality and construction costs of the projects.

The evidence from the 19 motorway BOTs in W province showed 10 of 19 projects were delivered over four months late. Two motorway BOTs reported delays of 2 years and 5 years in 2008, due to the resistance of local residents and the financial difficulties of the contractors. In these two cases, penalties were not made by the governments. In the latter case, the risk (financial difficulties) were included in the contracts, but did not clearly defined how much penalty the government should make. However, the rest of the 9 motorway BOTs in W province were completed and available for operation two months

earlier than originally planned. Two projects completed construction 8 and 10 months earlier than the time specified in the contract. As an interviewee who worked in the Department of Transportation W province pointed out, the main reason for the construction delays in the 10 motorway BOTs is that the private contractors and SPV companies experienced financial difficulties, although several other factors have been observed such as, poor project management, geographical conditions, land acquisitions and technical matters. Meanwhile, as this interviewee commented not all BOT projects were constructed with high quality standards. 8 (of 19) SPV companies and 15 BOT construction sub-contractors were publicly condemned by the Department of Transportation, in W province, due to their poor quality control and quality management relating to the BOT projects during the construction periods. The poor quality of motorway BOTs is mainly due to the unqualified construction sub-contractors that were selected and the lack of sufficient experience, skills and expertise in the BOT contractors. This will be referred to in the next chapter.

5.7.3.2 Construction performance of water BOTs: the evidence from W, Y and V provinces

The construction performance of the water supply and sewage treatment BOTs is much better than the motorway BOTs. Fifty of 56 water and sewage treatment BOTs (excluding the water and sewage pipeline constructions) completed construction works on time. The exceptions were 6 large projects that reported a range of delays from 1-8 months. As noted in the first section of this chapter over two-third of water supply and sewage treatment BOTs are small-size projects at city or county level and the initial investments on these projects was not large, usually between RMB 60 million-150 million. The private contractors did not have many financing pressures in the construction stage, therefore, the projects usually could be completed on time as Mr. A explained. However, the total operating expenses and costs are relatively higher than the initial investments for the water and sewage facilities and equipments.

The construction quality and investment in water and sewage treatment largely relied on the equipment and machines the project used. However, all the construction work associated with the water BOTs needed to reach the quality and technical standards and requirements

defined in the contract. The quality of the BOTs' construction was usually tested in the trial operating periods. The findings from the interviews and on-site observations revealed that during the trial operations of the water BOTs, most of the projects reached the technical standards defined in the contract, as measured by the procuring authorities and their experts.

In addition, the interviews with 7 project managers from the water supply and sewage treatment BOTs discovered that the construction costs of BOTs were significantly lower than the costs of conventionally funded projects which were developed by the governments in most cases. The project managers from the W, Y and V provinces stated that the actual construction costs of water BOTs were even lower than the private contractors reported to the governments.

5.7.4 Operational Performance of Motorway and Water BOT projects

5.7.4.1 Operational performance of motorways: the evidence from W province

Compared to the water BOTs, the motorway BOT projects are more asset-specified/based projects. In W province, the Provincial Highway Agency of the Department of Transportation unified and controlled the operation of the motorways network, rather than leaving it to the BOT contractors. Most of their operational works were done by the public sector, such as tolling services, motorway traffic management, services' station management, emergency/disaster management and motorway signs management. The private contractors/subcontractors was only responsible for the main maintenance works and general facilities management.

5.7.4.2 Operational performance of water BOTs

The performance of the operational water supply BOT (TOT) caused the price of tap water to rise and was the biggest problem for BOT models. As four officials from three different city councils in W, Y and V provinces discovered, if BOT (TOT) and joint-venture models were adopted in one city's water supply sector, the water prices for local residents would go up soon after the BOT contracts had been signed.

On the other hand, the performance of sewage treatment BOT and TOT projects also seriously suffered due to the underdeveloped pipeline networks in local areas, as conventional funded projects have experienced. Under current Chinese water industrial policy, water and sewage pipelines and networks cannot be financed and owned by private contractors. These pipelines have to be built by the local councils, leading to the development and construction of local water pipeline networks progressing very slowly, due to local councils having insufficient funding. Therefore, sewage treatment BOT projects usually could not work properly because the residential or industrial waste water had not been channelled into the treatment facilities and plants.

The data gathered from K city, W province showed that none of 7 city and county councils had completed their sewage pipeline networks by 2008, although 6 sewage treatment BOT plants were completed and had been operating for several years.

Furthermore, for technical and weather reasons, the sewage processing results of BOT projects were unstable in all six provinces. The main technical and performance indicators of sewage treatment BOTs often cannot reach the standards and requirements that the contracts specified. In addition, at least five sewage treatment BOT contractors were found to be directly discharging sewage into local rivers, lakes and seas without any treatment, to reduce their operating costs. One of them was a world-class water multinational company which had a good reputation.

5.8 Have Motorway and Water BOTs met the local demands and improved local infrastructure investment decision-makings

As five decision-makers from the central and local governments stated, one critical success factor of implementing BOTs in the Chinese motorway and water sectors is if these projects can be efficiently responsive to local demands.

*Such as, can a motorway BOT project solve local traffic congestion problems?
Or can a sewage treatment BOT enhance the city's water pollution and improve
water quality of the local rivers and lakes?*

A Director of a city Council

5.8.1 Identifying local demands, the design and planning of BOT projects

As two officials from the department of transportation and the local Development and Reform Commission stated, the most difficult task for the local procuring authorities and BOT contractors is how to identify the real needs of motorway and water infrastructure projects (the Needs Assessment). The research participants from W province and the Ministry of Transportation mentioned that the BOT contractors and public agencies at local level often could not correctly and precisely forecast real demands, leading to poor planning and design. Poor planning by local governments and private contractors damaged the quality and efficiency of BOT projects. Therefore, some motorway and water BOTs failed to fulfil the local demands on the public services during the project planning processes.

The planning of motorway and water industry were and normally conducted by the Development and Reform Commission at the central governments (in the 5-Year Plan of China). However, at the individual project level, the planning work was undertaken by the city councils, and approved by the provincial Development and Reform Commission. As an interviewee from the central government stated the planning at central level has been largely decentralised in the last 8 years, since the central government believed that local

government had more knowledge and information of local demands of road and water infrastructure. However, in this study, it may not be true. In the case of motorway BOTs, the different planning on motorway networks by different provinces often segmented the motorway networks on the provincial borders. It also damaged the whole efficiency of the national motorway system. Even in a province, it was often observed that width of motorways differed. For instance the G4 Motorway (from Beijing to Hong Kong), which has some parts as ‘double directions, 4 lines’, some parts are ‘double directions, 6 or 8 lines’. This is because of different planning policies by different governments at local level. The result of this segmental planning in the Chinese motorway network is traffic congestion on the G4 were always regularly at certain times and in certain areas.

At the individual project level, the planning work done by the city councils is also important for the success and failure of BOT projects. The robust pre-feasibility study and the feasibility studies at later stages are very necessary in the planning and decision-making process. In field studies in the six provinces, a number of planning issues were observed, particularly the absence of an assessment of alternatives, an objective needs assessments, a strong economic and financial appraisal, and an environmental and social responsibility analysis (for local residents who were affected by the projects). All these factors have contributed to project delays or cancellation at later stages.

Meanwhile, the primary investigations on 96 motorway and water BOTs found that the design of the BOT projects normally had been undertaken by the governments and procuring authorities before the BOT bidding. As the three interviewees explained the governments normally found that the Chinese private investors have poor designing capabilities. In some BOTs, the private investors were responsible for the design of the projects, yet only a few private companies have the experience and capabilities to carry out such super-large infrastructure projects, except for several water multinationals and a few Chinese BOT contractors who are experienced in the water industries. This is because:

‘... nearly all of the best infrastructure planning and designing institutions in China are state-owned companies. The private sectors have only been allowed into Chinese infrastructure and public utilities industries for five years, they [do] not have [the]

capability and resources to do that...'

A vice-director, at city's Development and Reform Committee

Therefore, a large number of private sponsors of BOTs have neither the experience, nor the expertise to design motorways at present. Chinese private investors still need time to learn how to develop BOTs. Moreover, because of the Chinese government's decentralisation, many new projects, especially highway and sewage treatment BOTs, were planned and designed in a very short period without good preparation and study. So, the local governments' capabilities for designing large public projects and facilities were widely debated and questioned:

'...provincial and city's communication (transport) departments have their experts and advisors. But, it is true that the central government, the Ministry of Communications, have the best full-time (and part-time) expertise and advisors in Chinese motorway industries...'

A director, from a consulting firm

Furthermore, evidence from W and S provinces showed that some project teams and local authorities were too over-optimistic and failed to forecast the demands of the BOT projects due to a lack of basic data and information. The actual volumes of traffic in 3 motorway BOTs have been substantially less than forecast, although these numbers were produced by their external experts and advisors. In these motorway projects it was found that:

'...the real traffic flows were not even over one third of the forecasts... therefore, the private contractor just cannot maintain the operation, and the total revenue and cash flows cannot cover the costs incurred...'

A manager, Urban Development and Investment Company, at city level

This problem was even more common in the water industries, especially the sewage treatment industries. As mentioned in the last section, a number of sewage treatment BOT

projects were not in normal operation, because of the absence of or the underdeveloped pipeline networks in local places. These failed to gather sufficient sewage from local residents and industrial consumers, as noted in the last section.

In contrast, at least 6 motorway BOTs interviewed were found to have under-estimated the traffic flow.

‘... in our projects, the real traffic flows of the motorway are far over the designed capabilities, leading to the higher depreciation and maintaining costs for the private contractors. This also largely limited the designed driving speeds of these roads, normally no more than 40 miles per hour on the road, leading to the dissatisfaction of road users...’

A Director of the Highway Agency at provincial level

Later, as the Highway Agency found that the extra volume of traffic were not from local regions of W province, but from the other five nearby provinces. Although local authorities suggested and encouraged private contractors to extend the width of the motorways later, the requests were rejected, due to the private contractors’ tests showing that the costs of widening a motorway were the same as building a new one.

5.8.2 Political and administrative interventions on motorway and water BOT projects

BOTs were introduced into China’s motorway and water sectors, due to the government wanting to improve public infrastructure investment decision-making and reduce the political intervention. Nearly all participants from Chinese local authorities believed that developing motorway infrastructure in China at local level is not only an economic objective, but more importantly, a political task. The present national and local political objective in China is to ‘develop the economy’ (in some context, this is taken to be the increase of GDP). This objective meant that local governments had to show a good performance on local public infrastructure developments. Meanwhile, the participants from local authorities admitted that infrastructure development is an important indicator to evaluate Chinese local authorities’ performance. Improvements in infrastructure and public

services are more visible for both their superiors and local residents.

'The progress on developing motorway and water infrastructure is more visible. And the related public facilities could be developed and completed in five years (one term of office in Chinese government). Therefore, the progress on improvements to public infrastructure and services can be easily noticed by superiors and local residents. Also these could be treated [as a] positive track record [in an] official's career history...'

A regional manager, from a state-owned bank

Due to strong competition between (and in) different councils in China, the provincial and city councils often compared their infrastructure indicators to look for the best practices as benchmarks. Therefore, developing motorway and water infrastructure in China has often become a priority and a comprehensive task for local authorities. Local government and local leaders have to develop new public projects, facilities and services for local residents and communities to achieve the expected economic, social and even political benefits, or they will lose the competition.

As some managers from the banks commented, in some provinces, the governments heavily relied on BOTs for developing motorway and water projects. The relevant decisions were made, not based on status of projects, degree of competition, feasibility studies or evidences-based investigation, but by political reasons and incentives. For instance, one motorway BOT had been built for connecting one city and the nearest airport as local leaders advocated and insisted. However, the real traffic on this motorway only reached one-third of forecast traffic flows.

For a large number of water projects, the BOT model is not the optimal choice for local authorities. In these cases, BOT is adopted because the local governments and leaders want to construct them as soon as possible to fulfil the requirements of the central governments. For instance, China's environmental protection strategies and plans designed by the Ministry of Construction and the Ministry of Environmental Protection offered large pressure and administrative interventions for developing local sewage treatment facilities and networks. In 2005, the Ministry of Construction, Ministry of Environmental Protection,

Ministry of Finance and the National Development and Reform Commission jointly and compulsorily required all cities and towns with a population over 300,000 to build at least one sewage treatment facility. Any city council failing to achieve this task, had their budgets in 2006 and 2007 cut down. As a result, over one thousand of sewage treatment BOT and PPP projects have been applied in different provinces and regions. However, few of these projects addressed the absence of and the underdeveloped waste water pipeline networks. The BOT model was applied because of the political and administrative pressures from the central government.

From this aspect, some interviewees from the local authorities believed that the Chinese BOT model had little difference in planning and design and construction from conventional funded projects, due to political and administrative intervention still being strong. The decisions were not based on the local demand and the local market, but by political and administrative intervention.

5.9 Applying BOT in local motorway and water projects: boosting local economy, markets and job opportunities

5.9.1 BOTs boosting local economy and construction markets

The official objectives of the Chinese BOT claimed that diverse benefits will be brought by developing new infrastructure in using private investments. This would stimulate the local economy, drive local markets and, finally, contribute to the development of local communities. The results of group discussion and interviews with local officials showed that only when BOT was properly applied, would these benefits be realised in practice.

Although individual experience on developing BOTs differed, the interviewees from different local authorities widely agreed that private investment in public infrastructure is required to anticipate future development and to stimulate investment in other sectors and future economic growth.

‘...investing, building and improving local infrastructure directly stimulated [the] local market and economies, such as consumption of steel, construction materials and [the]

labour market.'

A General Director of a city council)

This study also shows that the BOT investments in infrastructure achieved some goals set by the government from an economic perspective in terms of the experiences from W, Y and S provinces. On the one hand, large number of infrastructure investments directly made contributions to GDP growth which is the main performance indicator for local councils in China. Also these infrastructure developments allowed growth in the wider economy, as one director from a provincial economic planning department confirmed:

'The annual GDP increases of our provinces were over 12% in [the] last three years (2005-2007),... a large share of this increase in GDP was contributed by investments in local infrastructure... large amounts of resources were put into [the] construction of highways, airports, energy and water projects in our province, in return, the provincial economy significantly rose.'

A Vice-Director of the Provincial Development and Reform Committee

'It was found that improvements in our infrastructure, such as national and local road systems, could indirectly bring positive effects on other related industries, such as logistics, [the] property market in certain regions and [the] motor trade market, finally, booming our local economy'

A Director, the Mayor's office of a city council

However, the interviewees from local authorities also admitted BOTs may bring financial burdens for the local governments, in the cases of the terminations of BOT contracts and when private contractors experienced financial difficulties. The local authorities have to provide financial and political support to save the projects and in some cases the governments had to take over the BOT projects.

5.9.2 The economic benefits for local business and residents

For local businesses and local residents, the well-developed BOT projects can bring economic benefits and provide more job opportunities. Although the individual experiences are different, all of the seven users from local business and communities expressed positive attitudes on developing local infrastructure.

‘Our company is a national logistics company..... We are happy to see ... big improvements and expansion in [the] national highway networks, because these improvements reduced the costs and improved the efficiency of our business operation...Our delivery lorry usually spent at least thirty-six hours on the road from the city to Beijing in 1996. Now, on the same route, we only need nine to ten hours because of the improvements [to the] national road system...’

A Chairman of a Logistics Plc

Meanwhile, according to the on-site observations and interviews in W, Y, S, U and W provinces, nearly all BOT contractors interviewed stated that the local authorities usually required them to hire local workers and offer opportunities to local business to participate in BOT projects construction. Therefore, BOT infrastructure projects absorbed a large amount of local labour and boosted local construction markets. Furthermore, BOT would open and widen new markets and offer more chances for local businesses which was previously not something that happened.

Finally, the evidence from W province suggested better highway networks and infrastructure attracted new investors and created more business opportunities, especially for local private businesses. In the case of W province, good investment environments and improved infrastructure systems attracted three world-class auto manufacturers to build seven car assemble factories by 2010. At same time, a super-large computing and mobile manufacturer also established its factories in W province in 2010, all these created at least 150,000 new jobs for W province in 2010 and 2011.

For many local residents their experiences are directed more on what BOTs bring for them:

‘... in [the] last five years many highway projects (both of BOTs and public financed) were built in our region, leading to hundreds of jobs for local citizens... I joined this company two years ago; the company is still looking for new staff...’

A staff member from a local transport SOE, the highway operator and employee.

5.10 Have BOTs adopted new technology and technical innovation?

The research participants from central and provincial governments believed that the adoption of new technology in BOT projects is important. As a manager from the city council mentioned,

‘If there is no new technology introduced and implemented in the projects, why do we need BOTs?’

However, the opposite views were also found. Several front-line BOT project managers from the urban management department at city and county levels argued that the BOT projects need the existing technologies and equipments:

‘... Adopting new technologies would probably increase the costs of the projects. Generally, advanced technology and equipment are more expensive and the possible risks of implementing new technology should be considered and analysed. In practice, new technology and equipment are not fully tested and easily make problems in practice. The adaptability of our workers on new equipment is also important...in our factory, the new equipment brought from Canada three years ago... always broke down because they are too new and our staff did not know how to operate it ... therefore, there are large risks and higher costs when introducing new technologies ...’

A manager, from a Water Supply Factory, the city's Public Utilities Department.

There are mixed findings on whether this objective has been achieved in current BOT practices in China. Evidence from some of the BOT water supply, sewage treatment, underground and power generation projects observed confirmed that the new technologies essentially were transferred by private sponsors in some super-large and technologically massive BOT projects, as required by the procuring authorities.

However, negative examples were also found in this study. New technologies were often adopted in large water supply and waste treatment BOT projects rather than in highway projects. A BOT contract manager explained that:

'... This is because the water industry has more strict technical requirements on water processing services and quality which may be written in the BOT contracts. Without key technology and equipment for water processing, private operators could not reach the requirements of BOT contracts...'

a manager, from the BOT contractor side.

For highway BOT projects, the local public sector managers and directors are very suspicious of the introduction of new technology by the private sector. They thought that a private contractor may be good at business management rather than engineering techniques in highway and bridge projects.

'...they (private investors) do not know much about [how to] design highway and bridge projects... but they are good at highway services and advertisements [and] other commercial management...'

a director from the Highway Agency

5.11 A Summary

The findings of this study showed that the applications of BOT in China's motorway and water projects were not as good as the government expected or claimed and the previous studies suggested. Some official goals have been met, while a number of important claims of the government on BOTs were not achieved in practices.

Firstly, this study shows BOTs did bring the private investments into China's motorway and water infrastructure projects, increasing the availability of local public infrastructure funding. However, BOTs have a profound influence on the local government's financial situation. The potential fiscal risks of using BOTs in the motorway and water sectors are critical and large, as some interviewees from the central government stated. Meanwhile, the poor financial capabilities of Chinese domestic BOT contractors showed that the private investors do not necessarily introduce the stable investment capital to public infrastructure projects.

Secondly, the evidence did show that if BOT were properly applied, it did accelerate the development of the local motorway and water infrastructure at provincial and city levels.

Thirdly, this study discovered that the monopoly of the state in the motorway and water sectors had been broken, due to the large number of new multiple ownership BOT contractors introduced since 2001. However, the monopoly on motorway and water infrastructures seems to have been transferred to the private BOT contractors for as long as 20-30 years. Due to the characteristics of public motorway and water sectors and the ineffective procuring and bidding mechanisms, the competition and efficiency of China's motorway and water BOTs have not been strengthened and improved in a number of cases. The investment decision-making on developing local motorway and water industries has not been improved by applying BOT models, since the BOT projects also suffered as a result of political and economic interventions from local and central governments.

Fourthly, has the motorway and water infrastructure developed by BOT models fulfilled the local demands for public services, but not in all cases. A majority number of sewage treatment BOTs failed to effectively respond the local demands on environmental treating services.

Finally, the investments of BOT projects raised the annual GDP figures in the short term,

which was seen as an important political performance by local governments and local leaders. Properly developed BOT projects created more job opportunities for the local markets and improved the investment environment.

As investigated by this study, in all 84 highway, bridge and water BOT projects, twenty-three BOT (TOT) contracts were finally terminated/cancelled and the projects were taken over by local authorities. Also, 25 projects were still in construction or operation but already had various major conflicts between the private and public sectors. Only thirty-three achieved acceptable results where the projects are operating as normal without fundamental conflicts between governments and private contractors. This highlighted the large termination rates within China's BOT contracts. Although this result only covered six provinces and ten cities, managers from both of Chinese central and local authorities pointed out,

'[The] high failure rate of Chinese BOT is not special in some regions or some industries, it existed in all industries all over China...many projects were just terminated in [the] first five years, projects even failed before the construction [was] completed...'

A Director, Ministry of Construction

The reasons for the high termination rate of BOTs in China's motorway and water projects are the poor financial capabilities of BOT contractors, poorly designed motorways and water projects, and the un-expected low revenues of BOT projects etc.

However, as discussed in the next chapter, wider factors and influences from institutions and external environments caused the high termination rate of Chinese BOTs. The next chapter will discuss the conditions and emerging challenges for successfully applying motorway and water BOTs by addressing the institutional and other socio-economic environments in China. In addition, chapter 6 considers and discusses the problems of using BOT as a long-term contract-based approach to developing local infrastructure projects. At

the end of chapter 6, the problems, conditions and lessons of using BOTs in China will be presented.

Chapter 6 Contracting Public Infrastructure and Services: BOTs in China's Motorway and Water Sectors—the Institutional Context and Difficulties

6.1 Introduction

This chapter presents the research participants' accounts of implementing BOTs in China's water and motorway projects and focuses specifically on problems of applying the BOT model within China's socio-economic context. In this chapter, it draws on data from interviews and the focus group. It is supplemented by the data gathered from observations and the perceptions of both the private contractors and bank managers. However the focus of this research is on the views of the managers, directors and policy-makers of the Chinese governments at different levels. In the following sections, these issues are investigated:

- opinions and values of policy-makers and executors on the uses of BOT at city level,
- problems of the BOT as a long-term, asset-based contracting method
- importance of China's contextual influences,
- availability of resources and capabilities for the government on developing and implementing BOT projects,

This chapter also uses the model of 'Lesson-learning' (Rose, 1993, 2007). As an initial and important step to learning lessons from the UK's PFIs, the problems associated with BOTs in China are identified. Meanwhile, the contextual and institutional matters in relation to the implementation of BOTs in China's motorway and water projects are examined, in order to explore the feasibility and transferability of the PFI's lessons. Richard Rose (1993, 2005) pointed out, that when governments consider introducing a new programme, there are a few conditions that have to be identified, notably,

- opinions and values of the policy decision-makers and executors,
- dissatisfaction with the present policy or programme;
- complexity of the programme
- availability of resources and institutions for promoting the implementation of the

new policy;

The research participants have noted that Chinese BOT policy has achieved positive results in some of the projects when the BOT model has been properly implemented. BOT has mobilised a large amount of investment into infrastructure projects, it boosted the local construction markets and increased the work prospects for other industrial markets. However, not all results were positive, as the research participants' comments have shown in the last chapter. In practice there were many unforeseen difficulties and problems in the application of BOTs to the motorway and water sectors.

6.2 BOTs in practice: the opinions and incentives of policy-makers and executors at city level

6.2.1 Dissatisfaction with BOT's performance: the perceptions of public sector managers and decision-makers

Considering the evidence collected from China, the majority of the research participants from the public and private sectors were not satisfied with the results of the implementation of BOTs in developing local infrastructure projects. This was irrespective of whether their attitude to the policy was critical or favourable. Twelve research participants were strongly critical of the use of BOTs. However 5 out of 21 interviewees showed favourable attitudes to their use. In addition, 8 participants believed that China's BOTs were problematic at the time, and still had room to improve. Although their point of views differed, they all agreed that the implementation of BOTs had not been as good as they had expected. The research participants reported a significant number of problems. This research highlighted that 23 out of 87 motorway and water BOT contracts were finally terminated or bought out by the governments. These included 18 water projects and 5 motorway BOTs. The participants pointed out that there were various reasons that may have caused the termination and "buy out" of the BOT contracts by the government. Ten of the interviewees from central and local governments believed that there was not one specific reason that caused the contract's to be cancelled. However, they had often experienced a series of problems in the planning,

designing, financing and negotiating stages, leading to the disruption of the whole project. Detailed reasons are presented in table 6.1

Table 6.1 Reasons for the Cancellation and Buy-out of BOT contracts by Governments

Number & Type of BOTs affected	Cancellation and buy-out of BOT contracts	The potential and fundamental contributing causes
3 Motorway 12 water	Planning and designing issues	1) Ignorance on BOT project selection 2) Weak assessments of needs by public authorities 3) Overestimated revenues by both governments and contractors 4) Overlooked risks by both governments and contractors 5) The facilities supporting the BOT projects were not working properly, especially for water BOTs. Complete pipelines had not been built as governments had promised.
4 Motorway 7 water	Contracting issues	1) The local authorities failed to meet their promises agreed in the contracts 2) The governments tried to transfer risks as much as possible, leading to expensive contracts, project failure or contract buy-outs.
3 Motorway 7 water 2 Power Stations	Major Risks	1) Underestimating of public opposition in the local communities 2) National policy and strategy changes 3) Demand risks 4) Increasing prices of building materials 5) Inflation 6) Others
5 Motorway 15 Water	Financing for SPV dried up	1) Contractor underestimated financing risks 2) Poor Financial Planning and management by the BOT contractor 3) Economic Crisis

6.2.2 Why BOT was adopted: the incentives and values of decision-makers and executors at city governments

However, before discussing the contributing causes leading to the termination of BOT contracts, the incentives of using BOT by governments at city level need to be addressed. As has been noted in section 5.8, the governments at city level are the real executors of BOT policy in China. The city councils actually decide which projects should be built and

how they are financed. The findings of this research show that the key motivation of Chinese city governments still emphasizes the maximizing of the investments rather than improving efficiencies. The city councils and local leaders did not initially intend to use BOT as a long-term strategy to develop local infrastructure projects. The BOT model was adopted, to a very great extent, because of political pressures on the city government's or by other short-term oriented targets. By using BOTs the governments at city level hoped to postpone their current fiscal crisis or administrative issues. BOTs were often used in many cases, as a 'buffer' to delay a local financial crisis. For instance, a vice-mayor in the city government mentioned,

'...We were experiencing lots of pressure from provincial government, and even from the ministries of central government. They urged us to build 7 sewage treatment plants in three years...However we did not have budgets to do so. Also other financing methods were not available... then BOT is a choice... by using BOT we were able to build the project first, and then we are able to consider what subsequent problems BOTs brought in.'

Another senior officer in the city council commented that,

'It is not about if the BOT model is good or bad... for the council, we need to build the projects as soon as possible...BOT is a readily available option at that time.'

During course of the interviews with other senior officers and leaders at city level, similar answers were given. For the leaders at city governments, BOT is a useful financing vehicle rather than a management tool to improve 'value-for-money' in developing infrastructure projects. This finding highlights a fundamental difference between the objectives of PFI and BOT's.

The decisions of councils leaders had a major impact on BOT project's directors and managers. Five BOT project directors and managers from four different city councils commented that their task was to contract out the projects as soon as possible, to avoid pressure from their superiors. Another four BOT frontline managers also expressed this.

6.2.3. The key contributing causes of the termination of BOT contracts

By reviewing the terminated 23 motorways and water contracts, this research discovered that short-term oriented BOT policy resulted in the city governments and their staffs putting the emphasis on attracting private capital investment, while overlooking the importance of project planning, underestimating potential risks and selecting low-quality contractors. Many projects eventually failed as early as the planning stage.

Firstly, as this study reveals, important feasibility analysis is absent in many BOT projects, which would have included accurate assessments on demand, a good economic and financial appraisal, an environmental analysis and an assessment of the government's affordability. A preliminary feasibility study of a BOT project should be done to help governments to justify if the project is suited to the BOT model and what costs and benefits it will bring to the project. However, this study did find out that a very brief feasibility analysis and outline business plan was produced by governments and project managers in 20 cases, in order to get the necessary approval and planning permission from the provincial governments. Five managers from the focus group pointed out that the BOT project team in the government often had to prepare for a BOT project in a very short period of time and without sufficient information and data. Usually, the team needed to collect key information about the project and the local regions within six to twelve months. For example, for a water project, the BOT project team needs to collect and analyse some basic data and information, including the construction costs, the number of households in a local region, the number of households which are connected to the pipeline network, the length of pipeline, the potential costs of operation and maintenance, the financial availability of local governments and the potential revenues of the project etc.

However, in 20 BOT projects, the preliminary feasibility studies and the outline business cases needed to be finished by the governments in two months. The public sector managers and directors had no time to collect relevant data. Without this necessary information and sufficient time, it is not possible for the governments to make good justifications on the use of BOTs.

The three interviewees from the consulting firms commented that for both water and a motorway project, the most difficult task is to estimate the local demand and then make a strong business plan. As this research revealed, in 12 motorway and bridge projects, traffic

forecasts were over optimistic and overall costs were fairly underestimated. These facts have all finally contributed to delays and interruptions in projects which were, finally taken over by the governments. In practice, the government's BOT teams often failed to make an accurate assessment of demand, due to a lack of time and relevant data to do so.

Interviewees from five city councils mentioned that they had tried to introduce external advisors as earlier as possible to improve the quality of BOT planning, preparation, procuring and negotiating work. However, there are very limited funds for the local councils to hire high quality advisors and for conducting good preparation work before starting a BOT project. Furthermore, lack of financial, legal and managerial experts in the government also constrained the introduction and operation of these projects. Discussions and observations with public sector managers indicated that the governments at city level focused on speed rather than quality during the preparation work. Driven by short-term objectives, 12 small size water BOT projects eventually failed at the project selection stage, due to their small scales, lower revenues, higher transaction and operation costs, uncompleted pipeline networks, and small number of pipelines connected rate to households.

Secondly, risk analysis was rarely addressed and identified in the feasibility studies and contracts by the governments. Four interviewees from different city councils stated that risks normally had not been properly identified, valued and allocated in these BOT projects. In many terminated BOT projects, the governments attempted to transfer the risks as much as possible to BOT contractors, though, in practice, this idea is not realistic. As all four managers from the BOT contractors debated, private contractors are not able to take all the risks of the project, e.g. risks for land acquisition and government policy changes. In 12 motorway and water projects, the termination of the contracts happened because too many risks were transferred to the private contractors. However the contractors were not able to mitigate these risks.

Thirdly, the weak financial capabilities of the private contractors often led projects into financial difficulties. Twenty BOT projects were interrupted or seriously delayed, because the contractors' financing dried up. 15 of them were finally taken over by the local governments or the local state-owned enterprises. A senior director drew lessons from his

two BOT projects:

The first important lesson for the government is to select the 'right' contractors with strong and stable financial and technical capabilities. In our experiences, many motorway bidders met financial problems even before the contracts were signed.'

Five interviewees from the city councils explained that the primary justification of using BOTs in China was to attract private finance and capital. If the private contractors could not provide the finance for the BOT projects then they were pointless. In terms of the results of interviews with local officials and decision-makers, a number of low-quality and inexperienced contractors were selected by the governments through non-competitive one-to-one negotiations. The evidence of this research has shown that these contractors failed to provide long-term and stable finance to the BOT projects.

The negative experience from 23 terminated contracts showed that the government's short-term oriented strategies had profound influences on BOT practices. With large political and financial pressures, leaders in the city councils often made short-term oriented policies and decisions. The executors and practitioners of BOTs, e.g. project directors and managers, also had insufficient time, reliable information or enough resources to conduct good preparation work. Three interviewees from the central governments commented that local governments always focused on the numbers of projects and how fast they were built in local areas, but ignored quality of service delivered to the end-users. These research participants commented that BOT as a long-term, contract based approach is still a new idea to Chinese local governments. The policy-makers and executors at local level only concentrated on the benefits of using BOTs, ignoring the weaknesses in practice. In the next section, this study will present the results of data analysis by addressing the emerging issues in the BOT contracting process.

6.3 The Implementation of BOTs in China's Motorway and Water Projects: the Emerging Problems with Contracts

All interviewees from the central and local governments believed that one of the major differences between publicly-funded conventional projects and BOTs is that the BOT model heavily relies on a long-term concessional contract. The BOT approach was expected to bring certain benefits by clearly defining the objectives of the project, and by identifying and allocating the risks involved in the project's design, construction, finance and operation within the contract. Meanwhile, the BOT contracts were deemed as a check list for the performance of the BOT projects. At least 10 of the interviewees believed a well-designed BOT contract was critical for the success of implementing a BOT in China's motorway and water sectors. Officials from the Ministry of Construction stated that in the last 10 years, both the central and local governments have attempted to improve contracting practices in the motorway and water BOTs, by issuing China's Standardised Contract Models on water supply BOTs in 2004 and sewage treatment BOTs in 2006. Although there was still no standard contract model for motorway BOTs by the end of 2009, some provinces involved in this study adopted the Standardised Contract Model on motorway projects. They were designed by the FIDIC (the Federation of the International Consulting Engineers) and advocated by the World Bank. This study found that such FIDIC contract models were implemented in 10 motorway BOTs, 3 large water BOTs, 3 bridge BOTs and 2 tunnel BOT projects. Following the publication and introduction of these standardised BOT contracts, the quality of BOT contracting practice at local level has been improved as 5 interviewees from the local governments commented. Mr. Q pointed out,

'at least, the BOT project managers and the officials in the public procuring authorities have something (Standard BOT contract models) like references on their hands. It is much better than nothing.'

A direct manager from a city council

However, this study also explored that in practise; the use of these BOT contracts did not

realise and achieve the benefits expected by the government and its officials. The lawyers and managers from 5 city councils complained that the contract models issued by the Ministry of Construction were still incomplete and too simple and too broad. There were a number of contracting matters that had not been clearly identified and explained in these standard contract models. As 2 lawyers working for two different city councils complained,

'from the professional view points and legal aspects, these standard BOT contract models are too simple and broad to use in practice. Some important matters have been mentioned in the contracts, but the central governments have not offered practical solutions to local authorities. For example, matters related to the identification of projects risks and their allocation between the public clients and private contractors, the pricing and unit price adjustment mechanisms, the compensation arrangement if the contracts were cancelled, and the performance measurement and inspection mechanisms... the core and key matters and questions related to BOT contracts have not been answered by the Ministry of Construction.'

A Chief Legal Represent from a city council

The barriers and difficulties of using BOT concessionary contracts to develop local motorway and water projects in China have been revealed in this study. The major ones include the following:

- The higher transaction costs of the preparation, tendering, bidding and contracting of BOTs was a disadvantage of their application. This was pointed out by the research participants from both the public and private sector.
- The incomplete nature of the BOT contracts was not able to define and identify all risks related to the projects, namely, that it is impossible for the written contract to predict all possible events, uncertainties and risks associated with the projects during their lifetime.
- The uses of BOT contracts brought other risks related to the contracting methods because of opportunistic behaviours, e.g. the effects of 'lock-in' and the inflexibility of using a long-term contract and any delays in progress.
- At the same time, poor cooperation and relationships between the public clients and

the BOT contractors were discovered in two thirds of the BOT projects in this study. Despite this, good and close collaboration had been found in some projects.

- Finally, the evidence collected from BOT projects in 10 cities showed that local procuring authorities had insufficient capabilities and resources to measure the performance of the BOT contractors accurately and regularly.
- Meanwhile, independent and professional institutions, and standard procedures for conducting evaluations on BOTs were still missing at central and local levels, leading to the performance and output of the majority of BOT projects not being properly examined and inspected.

6.3.1 Transaction costs of motorway and water BOT contracts

As 6 of the BOT contract managers and 2 directors from the central government pointed out, compared with conventional projects, BOTs were more complex, since there were many participants from both the public and private sector involved. On the side of the public sector, BOT projects involved a number of approvals and complicated preparation work. The data collected from the on-site observation showed that medium-sized water BOTs needed the assistance and support from 10 different departments of the city council. At least 14 technical, legal, and financial documents and agreements needed to be made with at least 11 stakeholders of the project, for example, a purchasing agreement with the government, agreements or subcontracts with consultants, financial sponsors, material and resource suppliers, construction and operation subcontractors, technical standards and operational standards in terms of Chinese industrial requirements etc. The motorway BOT contracts were even more complicated than the water ones.

A motorway BOT contractor's manager mentioned that the motorway SPV where he worked, was composed of 2 main shareholders from two private companies, 5 to 8 construction sub-contractors (operation and maintenance sub-contractors), 8 material suppliers and 2 equipment leasers (not in all cases). There were 20 managers and engineers needed to deal with different groups of stakeholders, including 5 provincial government's departments, 7 public agencies at city level, 7 departments at county levels, leaders in township governments and even gangsters in local areas who controlled the local earthwork

market.

'It is difficult to manage such a complicated team (SPV). For instance, 4 construction sub-contractors have different capabilities, skills and experiences in building large projects. They have different working procedures and quality standards... also, it is very time-consuming to deal with the stakeholders from different departments. As a team leader, I should focus on the project construction and management but I am actually doing a public relations job...'

A project director from a motorway BOT contractor

Six project managers from local governments commented on how the complexity of the BOT contracts led to a lot of 'extra' work for both the government and private contractors and incurred extra costs and fees (transaction costs). The largest portion of transaction costs in the contracting process for motorway and water BOT projects was the cost of consulting and the work needed to prepare the tendering and bidding for the BOT. As this study discovered the total transaction costs for the motorway and water projects varied depending on the size, value and bidding methods that were adopted. The transaction costs were between 1% to 8%, with an average of 4% of the total capital investment of the BOT project. The transaction costs for motorway BOT projects were higher than those for water projects. Meanwhile, the transaction costs of the large-size BOT projects are much higher than the smaller projects. If one of the 'Big Four' accounting firms or the top legal advisors were chosen for the work by local authorities and BOT contractors, the transaction costs would be very high, since some of these consulting firms charge at a percentage of the contract value. Finally, the transaction costs of competitive bidding in BOTs were higher than the one-to-one non-competitive negotiations. This was because competitive bidding is a longer process needing much more time and with several rounds of bidding and negotiation.

The highest transaction cost was found in a large water supply BOT project which used competitive bidding. The consulting fees alone for the advisors was estimated at over US\$ 9 million which was 8% of the investment value of the project in 2001. Generally, the financing costs differed project by project, depending on the financial capabilities of the

BOT contractors, the duration of debt financing as well as the financial arrangements with the banks. Some government-owned companies could get low-interest loans (with annual interests of 4.68%-5.94%, during the period of 2004-2008) from the policy banks in China (i.e. Chinese National Development Bank). In the cases of the loans from the Chinese commercial banks, the annual interests ranged between 7.85% and 15.3%, during the period of 2004-2008 (estimated by three interviewees from these banks). However, the loans from the China's state-owned banks are difficult to obtain for private contractors. Therefore, a large number of BOT projects were funded mainly by equity finance. Data collected from five motorway BOTs showed that the equity finances ranged from 60% to 75% of the projects' total investments. The equity finance in water BOT projects has a higher rate ranging from 70%-100% of the project's total investment. Therefore, this study highlights that the financing costs of Chinese BOT projects are usually very high, since the projects are mainly funded by the equity finance of Special Purpose Vehicles' (SPVs') parent companies. At the same time, the financial risks for the Chinese BOTs are also high since the projects rely heavily on up to three private companies. As discussed in section 6.1, 20 motorway and water BOTs found that their finances dried up because their parent companies fell into financial difficulties at the beginning of 2008.

All interviewees from the 10 city councils believed that the transaction costs of BOT projects were very high, especially the 30 smaller-sized water BOT projects. As 7 of them commented the transaction costs of using BOTs were much higher than similar projects funded using the conventional approach. As one motorway BOT project manager from a local council explained,

'for example, in the motorway projects which were traditionally funded by the governments... the transaction costs may be just the costs for preparing the competitive bidding... since the contract is a short-term contract, risks are lower... in many cases, the contracts for motorway projects are fixed price contracts. Therefore, transaction costs of publicly funded projects should be relatively lower than BOT's'

These interviewees suggested that the BOT approach was not suitable for small-size water supply and sewage treatment projects. Some research participants from the focus group

argued that the consulting fees for a small water project were 1 million RMB (1% of the investment capital of the project). They believed this to be too high for a small water project. Another research participant commented that,

‘we spend over half a million to buy 300 pages [the BOT contract] from our consultants...is it worth it?’

The data from the interviews revealed that there were some attempts by local governments to reduce the transaction costs for BOTs. A case from a city showed, that the city council tried to contract out all 5 small size sewage treatment BOT projects together in a local region, in order to reduce the costs incurred in the preparation, tendering and bidding phases. In this council, 5 small BOT projects incurred 1 million RMB in consulting costs. As the local BOT project manager estimated, this probably saved 1 or 1.5 million in consulting costs for the council. However, the major problem in this case was that one single BOT contractor could achieve an absolute monopoly in a local water area.

In addition, there are also a number of water and motorway contractors (over 40 projects) who do not recruit legal, financial or technical advisors from outside of the governments. In this way, the councils want to cut down the transaction costs of BOT projects. However some negative experiences were found in many cases. The most common issues are serious flaws in contract design and the feasibility studies (as mentioned in section 6.2).

6.3.2 The incomplete nature of a BOT contract

Another problem with BOT contracts was that they often remained incomplete. This was due to the duration of a BOT contract being so long and that not all of the risks and uncertainties of the projects could be predicted and forecast precisely. 5 interviewees from central and local authorities believed it was absolutely impossible to write a complete contract to define all possible events or contingencies and risks over 30 years.

All of the participants from the governments and the private contractors noticed the incompleteness of the contracts although their opinions on the use of BOT contracts differed. The five project managers from the government believed that the usefulness of a long-term contract was very limited in practice. To try to reduce incompleteness and

increase the certainty of the BOT model, one city council tried to split 1 BOT contract into two shorter term contracts. One was called the EPC (Engineering, Procurement and Construction) contract (or Turn Key Contract), using one private contractor over a period of 3-5 years. After this, another (or maybe the same) private contractor would be responsible for the BOT's operation and maintenance with an O&M contract over the next 15-20 years. In this way, the city council hoped to turn the long-term BOT contracts into several short-term contracts to reduce the uncertainty surrounding the projects. However, the costs of these separate contracts could also be higher.

Another 7 interviewees from legal and regulatory departments thought that the contract was very important and crucial, namely a 'checklist' for the performance of the private contractors, as well as a standard guidance on the allocation of the risks and liabilities on both sides of the contract. These interviewees, particularly the managers from legal departments and consulting firms believed,

BOT contracts should be improved as much as possible. Thereby, the governments and private contractors should try their best to identify all the risks and liabilities related to the projects despite the negotiation of BOT contracts being very time and money-consuming.

A legal advisor from a legal firm

For water supply and sewage water treatment BOTs, the standardised contract models were published by the Ministry of Construction in 2004 and 2006. At least 25 small size BOT projects adopted these contract frameworks. However, a number of details and clauses were drafted by the legal advisors or lawyers for the government and BOT contractors, depending on the results of negotiations. 3 contract managers from 3 provinces verified that at least 18 motorway, water and bridge BOTs adopted the contract model of FIDIC which was widely used in China's large and super-large engineering projects. Two project managers argued that the adoption of the standard BOT contract did not solve the fundamental problems of the contract in practice and problems existed with many BOT contracts being of a long duration and incomplete..

6.3.3 Difficulties on identifying and allocating risk in a BOT project

The interviewees from the local authorities indicated that the most difficult part of drafting contracts and negotiating with contractors involved allocation of risk for the length of the contract. The most notable risks include, political and policy change risks, demand risks and the risks with construction, operation and maintenance matters that could be caused by changes in government requirements. There were also the risks in relation to the approval of price adjustments.

The research participants who had taken part in the negotiation of BOT projects believed that the most difficult work for them was to identify, allocate and value the risk. In the process of BOT negotiations over 50 risks were identified by the government and contractors from within the BOT project teams. However, as the research participants highlighted they had no experience of the allocation and assigning of these risks. Their comments were that,

‘both the government and private contractors do not want to give up [some risks allocation arrangements in the negotiating processes]... in fact, some risks should be shared between the governments and the contractors... but the governments still did not want to give substantial promises... finally, we have to put these issues into the re-negotiation clauses in the contracts’

A legal consultant from a consulting firm

The Chinese water and sewage treatment standardised BOT models did not provide the answers to matters of risk allocation and valuation. In this situation, three interviewees from provincial governments deemed that the experiences and skills of the BOT team were extremely important, because experienced experts and personnel had more knowledge on the effects of risks. One water BOT contractor recruited three retired engineers and surveyors who worked in public utility industries into their BOT teams. The contractor believed that these experts’ wide experience and skills were very helpful in identifying possible technical, operation and maintenance risks in water BOT projects.

In addition, it was inevitably that some risks would not be identified during the negotiations and thereby were not included in the BOT contracts. In these cases, governments and private contractors agreed that some contract clauses could be re-negotiated at a later stage

of the BOT's implementation, although in practice these re-negotiation clauses were rarely used by the governments and contractors. Three project managers commented that

'if the contract revisions are not big [impact on the revenue and costs of projects], it is not necessary to conduct formal re-negotiation. However if there are to be big revisions on the contract clauses, the governments normally have a big advantage in the re-negotiation process ... this is because of the government's strong bargaining power'

In section 6.2, this research reviewed most of the 23 terminated BOT projects who also suffered as a result of risk analysis and allocation. The evidence from China's BOTs showed that the governments tended to transfer the risks as much as they could. In many cases, the local governments adopted this strategy to minimize their own risks and potential losses. For instance, two motorway BOTs in a province met serious land acquisition conflicts with local peasants. This led to the projects being seriously delayed (3 years) by the contractors and incurring huge losses. The contractors wanted to extend the length of the BOT contracts, in order to recoup their losses. However, these requests were rejected by the local governments.

Similar problems were observed in another 26 small water BOT projects. The construction work carried out by the government on local pipeline networks was always behind schedule resulting in the privately owned sewage treatment plants unable to operate as expected. This resulted in consistent losses for private contractors, although some minimal guarantees were made by the governments. In this situation, the government did, neither make compensation to contractors, nor extend the contracts.

In a few projects the governments did transfer some major risks to private contractors, e.g. demand risks. However, the contractors required more return on their investments (risk premium). In the two water BOTs, the water tariff rate was doubled in just five years. In these cases, the governments did transfer the risks to private contractors, but the local water service users received an expensive service. The transfer of BOT risks also involved the problem of opportunist behaviours during the period of the long-term contracts.

6.3.4 Opportunistic behaviours in the BOT contracts

Both the local authorities and the private sector in China were aware of the incompleteness of the contracts. Both parties of the BOT contracts tried to gain the advantage over the other at both the pre and post contractual stages. This was found in observations as well in another fifteen BOTs studied.

Chinese local authorities and private investors both revealed opportunistic behaviour in the contracting process. Each tried to take advantage of the other at ex ante and ex post contract stages in both the motorway and water BOTs. The findings of this study indicate that most local authorities tried to ‘contract out’ their projects as soon as possible, due to the pressure of time from their superiors. Therefore, local government and their departments usually overstated the project revenue and released positive information while obscuring the negatives in the ex-ante procurement process. Some city councils promised guarantees, benefits and attractive conditions to private contractors in both procurement and negotiations, although these may often not be realised in the future. In these cases, contractors would be easily ‘locked in’ to BOT transactions and find it difficult to withdraw from the projects. As a result, local councils would have had stronger bargaining power with the contractors. This led to local councils having an advantage over the private contractors at the post-contracting stage, when projects were initially put into operation. Over a period of 8 months, five local authorities fell into arrears with their sewage and water supply contractors. The manager of one of these contractors’ told the author

‘In the contract, it clearly defines that if the council falls into arrears then penalties should be given... however, could a private company penalise a government in China? Joking!’

A contractors’ manager

Furthermore, ten sewage treatment contractors were forced to upgrade their systems and equipment without compensation and financial support from the city councils. This was because the central government raised the national standard for the disposal of sewage water. However, a BOT project manager working for the city council also complained that,

‘Some departments at the central level always change the policies or industrial

standards, without any notice or consultation... they issue a policy in the morning and rescind it in the evening [a capricious administration]... where can I find the compensation for them [BOT contractors], I don't think the council's leaders will agree to them ...'

A BOT project manager working in the city council

Similarly, the primary investigations discovered that contractors also took advantage of the government through opportunistic behaviour. This was due to the lack of contracting experience within the government, especially when non-competitive negotiations were adopted during BOT procurement. One government lawyer recalled that,

'The contractor hired two lawyers and an accountant from Hong Kong and Singapore to join in the negotiations... on the government side; I am good at Administrative Law procedure but not Contract Law. My colleagues also have no background in commerce or in financial matters. We cannot really understand the Water Tariff Adjustment Equation which includes a number of variables, like CPI, inflation etc. It looks reasonable and fair... however, later we found that the equation always benefits private contractors...thereby the price of water is going up year by year'

Meanwhile, due to the incomplete credit check system in China, many low-quality companies provide exaggerated or fake information and documentation in order to pass the evaluations and win bids. Also, many of the local governments over-emphasized the prices and costs of projects with little regard for the quality requirements of the procurement stage. As a result, private companies cut construction costs but offered very poor quality and service later on. One example from a motorway BOT project is below. The project manager from the government stated that,

'the contractor offered a low bidding price, and the government selected them... however, later we found that the quality of their construction work was very poor ... actually, we should have noticed that something was wrong at the beginning... since the unit cost of motorways is very transparent in China... about 55-60 million RMB/km (2006-2008)'

A project manager from the government

Another water BOT project manager also talked about the private contractor's opportunistic behaviour when he mentioned that

'Some private contractors are always tricky. We found a sewage contractor directly channel sewage into a local river at night without any treatment ...'

A water BOT project manager

Meanwhile, in seven motorway BOTs and eight sewage treatment BOTs, contractors overstated information regarding construction and operational costs to the government at post-contract stages, so as to achieve longer concessions as charges on water services rose.

6.3.5 Cooperation and Partnerships between BOTs and governments

Because risks were not properly defined and apportioned, the specific outputs of the projects were not clearly identified in the contracts. In China's BOTs, the relationship between government and contractor were not always amicable. In most cases the government usually dominated the implementation of contracts and the contractors had very limited powers to bargain and negotiate with the public procuring authorities. As a manager from a BOT contractor commented

'The positions of the BOT contractor and the governments are not equal. In Chinese BOTs, contractors bear more risk...'

Both parties in the BOT contract largely focused on what 'revenue' or benefits they could achieve in a short period, rather than what improvements on efficiency and quality of public facilities and services they could make. As responses from the interviews with the managers from both public and private sectors showed, the government and the BOT contractor were always concerned with 'what benefits they can gain from BOT projects', rather than 'what they can contribute to the projects'. In a number of cases, this study found that both the government and the BOT contractor are 'revenue-driven' or 'benefit-driven'. In these situations, there were few cases where trust had been established between public clients and private contractors. As a BOT senior director working in the city council comments,

‘the council normally has a good relationship with the BOT contractors... but if the project’s revenue is not as good as the contractors’ expectation... it may be difficult to maintain a good relationship...’

In addition, with the impact of Chinese commercial and traditional cultures, most of interviewees who worked as contract managers believed that the BOT contract was just ‘a piece of paper’. They deemed that cooperation and trust between businesses could not rely solely on ‘a piece of paper’ but also needed goodwill, trustworthiness, resources, capabilities, experience, social relationships, networks and a strong history alongside their business partners.

In this study, it was found that in fifty projects, this was the first time that the local authorities and the contractors had cooperated. In other words, local governments and private contractors were not aware of each other before. Due to the short history of the Chinese BOT market, it is difficult to carry out a complete ‘credit check’ and ‘due diligence’ on both parties of a BOT contract. Ten interviewees commented that trust and cooperation were not strong in BOT projects between local authorities and private contractors. In some cases, the government and the contractors of the BOTs were merely ‘bound’ by ‘contracts’ and the ‘revenue’ that the project generated. Despite this both knew that the contract may be limited and difficult to enforce in practice. Once ‘major conflicts of interest’ started between public clients and private contractors, confrontations replaced cooperation and trust very quickly. As a result, this study showed that only one third of the BOT projects were

‘operated normally without conflicts between local government and private companies.’

A senior director from the provincial Development and Reform Commission

Of 87 motorway and water BOTs investigated, only 20 of them were operating as normal without major conflicts. Although difficulties were experienced when contracting out public projects, this study discovered that both sides of the BOT contract started to understand the importance of cooperation and trust by attempting to establish relationships to avoid conflicts in BOT contracts. Two leaders from two city councils suggested that the governments should address the long-term benefits of the implementation of BOTs, not the

short-term ones. Private BOT contractors also attempted to use new approaches to work with their clients in the form of a joint venture structured PPP with mutual benefits advocated by some project managers. The six managers from the public sector and the private contractors preferred joint venture (or joint-work) PPP so that they might directly combine the interests of their clients and the contractors. In the form of a joint venture (joint-work) PPP, the local councils could share future revenue and risks with contractors, build commitments together and minimize any opportunistic actions in the implementation of projects.

Another form of 'joint approach' appeared in 3 BOT cases. Two sewage treatment BOT and TOT contractors offered 10% or 15% performance shares to local governments, allowing them to become performance shareholders and not pay capital investments but to receive dividends when profit was accrued by the BOT. By doing this, the relationship between the local authority and the private sectors was not simply client-contractor (services purchaser-suppliers) but changed to a 'profit-sharing', 'interest-binding' or 'cooperation' relationship with a long-term basis, as suggested by the 2 managers from private companies. Two managers from the public authorities also believed that

This is a realistic way to secure the private contractors' interests and not cause further damage to the unbalanced structure of the contracts.

The second approach was based on 'geographic relationships' and 'historical connections' between local authorities and contractors rather than 'purely competition'. In some medium and small size water BOT projects, it was explored that local authorities would like to choose their local contractors. These contractors had already built close relationships and trust with the local authorities or they had cooperated together previously. As a manager from the public sector explained, the main characteristics of this kind of 'BOT contract' were:

- *BOT contractors' parent companies were local businesses;*
- *contractors' businesses were mainly operated in local regions with a long history; both parties of the contracts had had over ten-years of cooperation;*
- *public clients and private contractors had had both a very formal and informal connection in the past;*

- *Government and contractors' staff frequently communicate at various levels through formal and informal channels; therefore both parties of the BOT know each other very well.*

The results of these attempts to build a good contracting relationship are still not clear. However, a few councils and contractors had begun to explore possible ways to establish a stable relationship between themselves. This study explores that when a BOT contract relies on the long-term relationships of trust between the government and contractor, the projects seems to be more sustainable. However, in a small number of cases, a very close relationship between the contractors and the governments may lead to monopoly positions for a small number of contractors. At the same time, this could easily lead to corruption, a problem that will be addressed later in this thesis.

6.3.6 Managing and monitoring BOT contracts

During the course of interviews, all research participants highlighted that the governments and their project managers both found it difficult to monitor and inspect the performance of the contractors. Since the contracts of China's motorway and water BOTs included some key technical standards and requirements, 5 BOT contract managers and directors from two provinces believed, in principle, that BOTs should be regulated by the contract. BOT contracts were used as a performance management 'checklist' where the contractors report their own performance against the performance indicators specified. 3 officials from the central government suggested that the BOT contract, used as a tool to monitor and manage performance, was important to ensure that the suppliers and contractors performed well. The interviewees who worked in local authorities verified there were detailed clauses in their BOT contracts to define how the governments should make payments or charge penalties to private contractors based on performance. In a few cases, some managers do not really know how to accurately write down the requirements of a contract (output specification in the PFI). As a project manager mentioned,

'we know some indicators can be used to measure performance, such as quality, revenue, costs, price etc... but, which one is important? are we sure?'

At the same time, in many water projects, the managers tended to list some national

standards in the attachments of the contract as the only criteria to measure private contractor performance.

In addition, this study found that in at least 10 motorway and 30 water BOTs, the city councils and their departments did not pay sufficient attention to contract management. The local government did not regularly inspect the service levels and outputs provided by the BOT contractors, although the central government required them to do so. In most cases in this study (especially for water projects) the local government did not regularly collect performance information or discuss performance with suppliers. This only took place when major operational and maintenance problems had to be dealt with. In 7 sewage treatment projects in one province, the operating results of the contractors had not been checked by the local authorities in the last two years. The project managers from both the governments and contractors failed to report the operating faults and under-performance information on time. It was established that the governments had few ideas on what costs and quality were involved in the operation of BOTs. Therefore, when a number of BOT contractors wanted to raise a charge on water and sewage treatment services, the local governments could not ensure these applications should be approved or not. This was because the authorities did not have relevant financial and costing information available.

At the same time, this study revealed that penalties were rarely applied to payments to contractors of the BOTs. 4 interviewees from a BOT consortium commented that

the governments did not often apply penalties on the contractors, due to them not enforcing the contract properly. Many operational problems were caused by the governments, which led to the quality of services failing to reach the standards defined in the contracts.

Especially for sewage treatment projects, it was very common for the city governments to fail in their completion of the pipeline networks, resulting in the sewage treatment BOT projects not working properly. In these cases, the city councils or public procuring bodies were unable to penalise the private contractors.

Furthermore, the evidence from 10 city councils showed that the local governments did not have adequate resources for performance monitoring. In two cities, the data from observations showed a part-time project manager in the city council had to manage at least

3 BOT projects, leaving potential risks unmonitored and unmanaged. There was also insufficient training and skills for contract managers across government. Four sewage treatment project managers from the local governments complained,

we do not understand the meaning of the data collected by the online water quality testing systems, due to the testing system being purchased from Canada, and the instruction books of the systems being written in English and French, not Chinese.

In this section, discusses the concept of using BOTs as within long-term contracts in China. The analysis of the data presented showed that BOT has some common problems involving Transaction Cost Economics, for instance, higher transaction costs, incomplete contracts, opportunistic behaviours and issues with monitoring the contract. The key findings indicate that the use of BOTs in developing infrastructure projects in China not only brought benefits, but were also costly. Although some councils were aware of these costs, solutions were not found. When the governments consider the future use of BOTs, they need to weigh up the costs involved in relation to the benefits gained by the project.

6.4 Institutions and resources as the necessary means to ensure BOT projects work in China

Institutions is the term used that refers to the formal organisations of government who are involved in implementing and delivering the BOT programmes (Rose, 1993, 2005). The influence of institutions on the programme is crucial, because they are an intervening variable in the operation of the programme. In the cases of China's BOTs, this refers to the organisations that are involved in the delivery of BOT programmes, including: public agencies and departments, private companies, as well as the BOT related institutions and organisations, such as banks, consulting and construction firms. These institutions had a profound influence on the output and results for the motorway and water projects. In other words, these institutions decided if the BOT policy could be made to work properly in China. Rose (1993, 2005) also comments that if governments want to create and implement a public programme, three resources are necessary conditions, namely, laws, personnel (employees of governments and private contractors) and money.

6.4.1 The means of implementation of BOTs: institutions in China

According to the evidence collected, the biggest challenge for the implementation of a BOT are the government's lack of institutions and institutional capacity, required to organize, manage and implement the projects. This study reveals that the government at provincial and city levels simultaneously face significant public management and institutional challenges as the number of BOT activities rise in many sectors and at different levels. Existing institutions and departments in the government did not have the capacity and systems able to take on the new regulatory roles of BOTs.

At central government level, the Ministry of Construction was reported to have organized some research conferences on the development of BOT policies in 2003 and 2005, clarifying some of the legal issues, building standard procedures and improving the regulations for implementing a BOT. However, only 4 of these standardized contract models were included in current BOT policies.

The evidence from the six provinces and ten city councils showed that they had tried to set up departments to manage and regulate BOT projects. All the local authorities involved in

this study established a public department called the ‘Major and Large Public Projects Office’ to plan, support, implement, review and regulate such public infrastructure projects in their local areas, including BOTs. The MLPPOs were involved in a BOT project’s procurement and review of its operations. However, its short history and the restricted availability of expertise and experience in managing BOT projects meant that these institutions were still not fully staffed and established within their authorities.

‘Our department only has a one year history. Therefore, we need more financial, technical, managerial and legal expertise [with] BOT backgrounds...’

A Director from the City’s Key and Important Project Department, the City council

‘...our staff is temporarily borrowed from other departments of city councils or provincial councils at present...’

A senior director from the Key and Important Projects Department, a provincial council

BOTs also involve complicated structures that require new skills and experts with BOT knowledge. These experts must be recruited to take part in the process of BOT negotiation, contracting and financing. One of the key challenges was that, instead of the traditional approach which focused on inputs, BOTs require skills and experts who could identify the outputs of a project. This involved specifications and targets that the private partner had to attain in order for payment to be made. It was also important to monitor the performance of the partner and foresee any risks that threaten the delivery of the project. However, this study discovered that ten local governments in China, especially in the medium and small cities, still did not have the necessary capacities to take on a combined approach that establishes new institutions and trains public officials.

‘...Even our staffs have no confidence and skills in negotiation... especially on pricing, risk allocations and performance indicators...’

a project manager, from an Urban Development and Investment Company, city level

For local authorities getting started with BOTs, a key condition was to have the necessary skills and expertise, usually by hiring consultants and external advisers.

‘We understand that it is essential to bring advisors into the project early rather than incorporating them into the team at a later date. In particular, the right advisors can provide the guidance on techniques, legal issues, financial problems, project monitoring and due diligence.’

a senior director, the city’s Development and Reform Committee, city level

However, the local authorities found that there were not many qualified consulting firms available in China. Also, there was no guidance concerning the hiring of consultants as advisers on BOT projects. Local authorities had no idea how to find a good advisor and which consulting firms were qualified to deal with BOT services. The experiences of six BOT contract managers expressed that it was important to ensure that only credible advisors with relevant experience were hired, while setting clear and binding rules of project governance, putting sufficient control mechanisms in place and developing standard contract guidelines so as to maintain a seamless integration of external advisers within government departments.

6.4.2 Expertise and capabilities of the governments: the constraints of water and motorway BOTs

By reviewing and analysing the personal profiles of the interviewees and their responses, this research found that some of the interviewees from local councils had insufficient information, skills and knowledge to carry out BOT projects, leading to them being at a disadvantage when dealing with skilled contractors. The big problems were related to the key decision-makers who worked in the city and provincial councils. Six decision makers at provincial and city levels had little working experience, knowledge, know-how and background specifically related to BOTs and infrastructure projects. This was despite all of them having a master degree or doctorate in Chinese literature, history, politics, or

philosophy. Related training on BOTs had not been given and detailed guidelines on conducting BOT projects were missing. So these decision-makers were unable to handle all of the matters concerning the implementation of a local BOT project. Officials and leaders without construction, legal and financial backgrounds often complained that they had little idea about what they should or should not do when adopting BOTs, especially when detailed guidance was absent. These factors also increased the risks of a BOT project leading, in some cases, to the government getting an expensive contract, or needing to buy-out a contract.

'... many problems [that] we had never met before, we are facing in BOT practices,... there are no standard answers, procedures or models available that could be followed... All that we tried to do is learn from our own practices. Well, it cannot be denied that many mistakes were made in this process...'

A director of Mayor Office, the city council

In addition, 8 project managers from the provincial and local governments had related backgrounds and experience in engineering fields. However, most of them had insufficient knowledge and commercial experience of managing the contractual, financial and legal matters of a BOT project. Finally, only 5 of the interviewees working in the city councils or government-owned investment companies had a financial background or relevant experience with commercial contract law. The findings of this research suggested that some key figures, officials and managers in governments needed more training, due to their insufficient skills and knowledge.

As 12 of the interviewees from the city councils suggested there was an urgent need for detailed guidance on the implementation of BOT projects at city level. Since the guidance on BOT models was not available to the practitioners, the leaders and officials of local councils attempted to gain experience and lessons by making short visits to, and studies of, earlier BOT projects in other cities.

'... we had been to Guangdong Province and Shanghai city to visit and study their

BOT projects to learn some experiences or lessons... also, some directors and staff in the councils were sent to the coastal provinces in China to study the BOT cases...'

A Director, the City's Key and Important Project Department, the City council

'It is common for officials and directors in different councils and departments to communicate and discuss PPPs and BOTs to get some experience.'

A leader from the Highway Agency, provincial department,

However, it was often not possible to get wide experience from other Chinese cities and it was difficult to learn procedures systematically in just a few weeks or on a month-long visit. Nine of the frontline officials and managers interviewed from local councils commented that the benefits of BOTs were always overstated by other councils and many negative lessons and failures of BOTs were ignored or underestimated. This led to:

'...BOTs look easy to implement and the benefits appear significant in other cities. However, when we adopted it we found it had many problems and [the] BOT became more complex and complicated than we imagined...it is easier to talk than to do...'

A the vice-director, the city's Development and Reform Committee

As this study reveals, although some lessons from the implementation of BOTs had been learnt by provincial governments in some provinces, e.g. high transaction costs, low quality of facilities and services, absence of regulation. However few of them were known by BOT practitioners at city level. Many lessons in the application of BOTs were not separately discussed and studied against the publicly funded conventional infrastructure projects.

Since there is not a local government association, no regular summaries or lessons-learnt analysis has been carried out by Chinese central and local authorities. This means that councils often make the same common mistakes when implementing a BOT. For example, a city council failed to attract enough bidders for their medium sized sewage treatment

project in 2001 by adopting competitive bidding. This was because of the projects' high transaction costs and low profitability. This lesson had not been learnt by other cities in the various provinces, resulting in 6 more city councils making similar mistakes in their sewage treatment BOT projects. A system of spreading BOT knowledge and skills had not been established by any of the governments.

The interviews with the officials from central and local authorities explored that China had a short history of implementing BOTs at provincial and city levels, due to many of them being started since 2002. However, the institutional capabilities differed from province to province, as this study showed. Only one province in China had reasonably extensive experience from using BOTs in their motorway and water projects, since some BOT projects had been applied here during the 1980s and 1990s. Some provincial governments and their expert officials had very little experience and know-how of implementing the BOT models in their motorway and water systems as these had only been widely introduced since 2002.

Furthermore, the large or super large cities had relatively long histories concerning the use of BOT projects. Data collected from six provinces shows that all 6 provincial capital cities with a population over 8 million had relatively longer experience of the application of BOTs. The interviewees from some provinces stated that, as large cities with a population over 8 million, they experienced greater pressure from the rapid urbanisation and economic developments of the late 1980s. The city councils had considered using BOTs in their urban motorway and bridge projects as early as 1986 and 1988. Although the majority of these BOT proposals were not approved by the central and provincial governments in the 1980s the city councils had gained some relevant experience on preparing and introducing private participants into public infrastructure projects. This experience involved concepts such as how to produce a feasibility study and how to prepare a BOT for procurement and tendering. However, the findings of this study also noted that some city councils were tackling BOTs for the first time in 2008 without any prior experience.

' ... BOTs are quite new things for us; they are different methods to develop infrastructure projects, compared with the conventional ways... '

A project manager from the department of Urban Utilities Department, a city Council,

According to data from the interviews, the distribution of BOT skills and expertise were very uneven in different provinces of China. Large-size city councils, as well as the authorities in economically advanced regions had more expert officials with BOT skills and experience than did those of small or medium size. For example, a provincial capital city council has a legislation office with over 30 full-time qualified lawyers to assist BOT projects. However, another medium-size city council only has three lawyers with virtually no experience of Contract Law and the Bidding Law that are relevant to BOTs.

As the interviewees from the 6 provinces commented, their competence and knowledge of using BOTs in motorway and water projects was important to the local authorities, especially those at city level who were executing and managing BOTs in practice. The experience of using BOTs had direct and profound effects on the capabilities of the officials during the preparation, procurement, tendering, contracting and negotiation stages. The 5 interviewees who worked in central government stated that the local authorities should be very clear about their procedures and ways of using BOTs. Firstly, local authorities had to identify what documents and financial analysis should be produced in the preparation stages. Secondly, in terms of the different sizes, capital value, industries, and rate of return of their projects city councils needed to consider their approaches and methods of organising the tendering of the BOT projects to attract more private bidders. Thirdly, local authorities needed to think about the selection of the qualified bidders, including the criteria of selection, and careful due diligence on the BOT's bidders. Fourthly, the public procuring authorities should decide a standard contract model to use in the drafting of the BOT contracts (the models of the Ministry of Construction or the International Federations of Consulting Engineers, FIDIC model). Fifthly, the public clients needed to calculate and analyse the unitary payments or charges for the BOT contractors and the duration of the negotiated contracts. Finally, local governments should design a system to measure and evaluate the performance (efficiency indicators or satisfaction rates of users, etc.) of the BOT contractors in the construction and operational stages.

These interviewees recognised that there were many practical questions that were important to the application of motorway and water BOTs in local places. However, central and provincial governments had not produced any detailed guidelines as yet. In this situation, the experience, capability and skills of the local governments and their expert officials were critical to the success of a BOT project. For example, competitive bidding had been adopted for 5 BOT motorway projects in some provinces in 2003, which was the same as the tendering method used in the publicly funded conventional motorway projects in China. However, the government in one province found that this method still did not necessarily select the best bidders, due to how the Chinese competitive bidding method worked. This was defined in the Chinese Tendering and Bidding Law, and was only suitable for publicly funded, short-term (no more than 5 years), construction contracts but the BOTs were 20-30 year projects, with long-term operational and performance issues. Therefore, as the participants stated in later motorway BOT competitive bids, the government had changed their criteria on the selection of preferred bidders making the operational capabilities an important standard to be considered by the public procuring authorities.

6.4.3 Collaboration between different departments in local councils

At local levels, BOTs also involved many departments in the public sector such as the local Communication Department, Public Utilities Management Department, Water Resources Department, Urban Construction Planning Department, Prices Management Department and Environment Protection Department. The collaborations between these departments were key determinants of the success of BOT projects. However, current practice showed that local departments find it difficult to co-operate with other departments when dealing with BOTs. The evidence from 3 cities showed that the local BOT procurement department had not been fully empowered. There was insufficient authority and limited power that could be used to manage and co-operate with other departments.

‘...many applications and plans for BOTs have to be approved in agreement with other departments. When the local BOT procuring department asked for our departments’ co-operation, we found that the working targets, methods, values and

even cultures are different between different departments, for instance, the legal department want to have plenty of time to read and study the clauses of the BOT contracts to ensure the interests of the city council in the future. Other departments have little time to spend on a single project and for various reasons they have to finish the project as soon as possible...'

A manager from the Key and Important Projects Department, city council

The information related to BOT projects, such as costs, revenues and key contract clauses, was rarely released by the local councils and their related departments. This is because of the commercial confidentiality of a BOT contract. Therefore, not only potential investors, but also other departments in the city council were unable to obtain full information about the BOT projects, resulting in some concerns, suggestions and considerations from other stakeholders in the governments. In commercial practice, the confidentiality of a BOT contract should be protected. However, as a public infrastructure and service contract, the end-users and the public should have a certain degree of 'right to know'. A financial director in a city council indicated that:

'Our department did not know many details of the BOT projects in the city, because their funding [did] not [come] from the budgets... the departments [that] carried out the projects and did not involve us. The projects did not need our involvement...'

Ms. C, the director, the city's Financial Department, the city council

This approach of using BOT's as extra budget finance will affect the financial situation of local councils in the future. At the same time, the governments' financial situation and resources would be badly affected in the case of any terminated BOTs. The outcome would be that buy-outs would come back onto the governmental budgets resulting in a big change to the local financial situation. Looking at the data collected from the focus group and two on-site observations, this study found that the collaboration between different government

departments was not good. In some cases, strong conflicts between departments were observed and reported by the research participants. One BOT project senior director commented that the BOT approach involved too many departments and institutions of the local council, notably, a water BOT project team required the cooperation of 9 departments within the city council. So BOT is an even more complex and bureaucratic method than are the publicly funded projects.

'It was a hard task to make this kind of team work... the progress of a BOT project team was usually not fast, until higher level leaders stepped in. Meanwhile, the competence and experiences of the members of the team differed as well. '

A vice-mayor from a city council

Five of the BOT project managers pointed out that the BOT programme did not improve efficiency in the governments, but increased bureaucracy, conflict and complexity. However, performance and collaboration of a BOT project team might be largely improved if the members and expert officials became familiar with each other.

6.4.4 Corruption and illegal activities involved in China's Motorway and Water BOT projects

The research participants revealed that the degree of corruption in BOTs was likely to be lower than that in the publicly funded projects. However, 'corruption' issues still existed in the implementation of BOTs in China's motorway and water sectors as 14 interviewees mentioned. BOT corruption is discussed in general terms and all examples cited here can be found from the published sources.

As the participants of the interviews pointed out corruption widely existed in both publicly funded infrastructure projects and BOTs. The evidence from the six provinces covered in this thesis showed that corruption in the motorway BOTs may be more serious than in the water projects. As interviewees explained, water projects are normally small projects and revenue is not high, meaning there is a less room to 'rent seek'.

From the materials and news published by newspapers in one province, over 10 leaders and

senior officials at provincial level were involved in corruption matters in 7 large motorway and water BOT projects during the last ten years. The interviewees commented that the corruption often occurred at the ‘tendering and bidding’ stage of motorway BOT projects. At this stage, few decision-makers or leaders in government could decide which company had won the contract. Given that the procedures and processes of BOT tendering were not transparent, the corruption was not difficult to instigate. The research participants from different city councils commented that,

‘To reduce the opportunities of corruption in infrastructure projects, the transparent process, procedures and criteria to select preferred bidders are important. But, in practice, it is difficult to do so....’

In some cases, contractors already knew who would win the contract. In one extreme case which was in a publicly funded project, a contractor started their construction works before the bidding process had begun. Corruption was often observed when one-to-one negotiation was adopted. This was because only a small number of staff from governments participated and only very limited information was released about how these staff was conducting negotiations with private contractors. i.e. there was very little scrutiny. The interviewees also observed that the decision-makers and the senior directors should not participate in BOT projects if they had close relationships with BOT contractors, subcontractors or external advisors. However, despite this, in some BOT cases, contracts or subcontracts were won by relatives or friends of local leaders. Also as mentioned in the last section, relational contracting needs the public sector and private contractors to build a good and long-term relationship. However in practice it was found that a relational contract could lead to just a few contractors in one market (monopoly) and eventual corruption.

Moreover, corruption occurred when the changes and re-negotiations on the key clauses of BOT contracts had been made before construction had begun. Most notably, as experiences from motorway BOTs in two provinces showed, the changes on original designs of the project, and adjustments in relation to the pricing of water and sewage services were affected. Finally, there is a culture of corruption in the construction industry in many countries, including China. In many cases, contractors may look for any opportunities to establish good relationships with public managers and directors, in order to gain advantages.

In this study, a public sector manager gave an example of this.

‘When I had a periodic meeting with some BOT contractors, I told them that if they wanted to find me, please use the landline number of my office. This is because I had lost my mobile phone the day before yesterday... whilst the next morning, I received four brand new i-phones from four different contractors, all of them paid for. They even knew my favourite network is China Telecom, not China Mobile... what I mean is that the BOT contractors would try their best to build a ‘close’ relationship with public sector managers and directors, in order to achieve advantages in the market competition...Finally, in this case, I had to return all the mobile phones to them one by one...’

A director from a city’s council

This study also found that, in some locations, the construction industry is deeply infiltrated by local gangsters. Even the gangs can monopolise the materials in the local construction market through ‘violent measures’.

6.4.5 Financing institutions and capital markets: the ‘bias’ for China’s domestic BOT contractors

This study identifies that China’s BOTs have a high ‘equity-financing ratio’ rather than debts financing. Chinese domestic private investors could not get substantial financial support from the Chinese state-owned banks and the Chinese capital markets.

‘Chinese banks’ main clients are the SOEs and quasi-public businesses rather than private business. The banks in China are controlled by the government and have very strict limitations, procedures and requirements for applications from private business. Basically, it is impossible to get strong financial support for investment in BOT SPVs or private businesses and companies...’

A manager, from a state-owned bank of China

These bank managers pointed out that compared with the SOEs, the credit for Chinese

private businesses was really poor, especially BOT SPVs which had a very short history and complex organisation based on shareholder structures. Therefore, approval of the loan applications from domestic BOT contractors was very strict. Another technical issue was that, in terms of Chinese Business and Enterprise Accounting Standards, the facilities and equipment used in BOT projects were not treated as the ‘assets’ of the private contractors. From an accounting perspective, private contractors in China could not use the BOT’s assets to back their own bank borrowing, and to secure their ‘debentures’ in the Chinese corporate bond market.

A manager working in a bank who participated in the approvals of three BOT loan applications stated, if a private BOT contractor (the parent company, not the consortium) expected to get loans from the banks, they had to raise at least 35% of the project investment initially. Given that 60% of capital investment had been collected and made available to be used for BOT projects, the banks were able to consider these loan applications. The maximum amount of a loan to a BOT project was limited at 15% of the total capital value of the project.

Meanwhile, as all 4 bank managers explained, since the banks had insufficient ways to identify and investigate the credits of private business due to the lack of a proper credit evaluation system in China, the government-owned banks only considered the private BOT contractors who were publicly listed in the Chinese stock market and with a credit rating over AA level (by Chinese credit rating companies). The managers from the banks explained that the strict management of applications from private businesses was because of past experiences of the bank. Bankruptcy rates for Chinese private businesses were far higher than for SOEs which were usually supported by the central and local governments. Therefore, the BOT investors in China found it was difficult to arrange finance. The managers from the private sector also complained that China’s banking system and capital markets were not open to them and that they had a strong ‘bias’ against private business.

‘Chinese banks only served the state-owned companies and government, they did not care about us, even if we have good projects, good credit and good financial situations. This is only because we are privately-owned...’

In recent years, there was a sign that more and more private companies tried to raise capital in Hong Kong and overseas stock markets. This study shows that Chinese private businesses had difficulty carrying out large BOT projects, because of their limited financial channels and lack of financial support from the Chinese banking system and the stock markets. Most investment funds (60%-90% of capital investment) on BOTs were self-financing by the private contractors themselves. Private participation in BOT arrangements was in relation to the financial capabilities of the private sector.

The managers and directors from both central and local authorities interviewed believed that the capability and resources of the private sector had a large influence on the success of BOT projects. By reviewing all the BOT cases in this study, it could be found that only a small portion of private investment was raised from 'debt financing'. The financial barriers on BOT investors had still not been removed by the government and the banks. This led to poor financial capabilities for private investors and high financial risks for China's BOT projects.

Compared with the Chinese private BOT contractors, the government-owned companies and the contractors from Hong Kong and other countries had stronger financial capabilities even during the Financial Crisis in 2008. Furthermore, in BOT projects funded by government-controlled companies, this study found that the contractors could easily get a 30-year low-interest loan (about 5%) from different banks and without strict credit checking. Finally, multinational companies also had strong financial stability in most BOT cases. Their projects were often financed by borrowing from the international banks or financial organisations. The evidence showed that some British and French commercial banks, the World Bank, the Asian Development Bank and the European Investment Bank had participated in 10 large water BOTs in China.

6.4.6 Low Quality, inexperienced BOT contractors and consultants: the barriers of applying BOTs in China

Interviewees from the central government estimated that there were over one thousand

private BOT contractors in China, and they were operating a large number of water BOT projects by 2009. However, as the officials from the Ministry of Construction commented that only 5% of China's BOT contractors had sufficient design and construction capabilities on the motorway and water infrastructure. In other words, they were not qualified contractors. By reviewing the profiles of BOT contractors, this study discovered over 40 motorway and water contractors had no experience and background in relation to BOT or infrastructure projects. At least 7 managers reported that a number of contractors were 'nouveau-riches' from other industries without any relevant experience to the BOT projects they operated. In this situation, these BOT contractors had to find sub-contractors to design construct and operate the BOT projects. However, the cases from the motorway BOTs in some provinces showed that the inexperienced BOT contractor could not manage and operate the BOT consortium properly and professionally. Evidence from at least 7 motorway and water BOT projects showed that the main BOT contractors nearly lost control of the management of sub-contractors and material suppliers.

Four interviewees from BOT contractors admitted that their businesses used to be non-specialised infrastructure companies. They later moved into motorway and water BOTs, because their companies were diversifying their investments and their core businesses at the time. BOT projects were a very attractive proposition to them, due to stable cash flows and 'good' profitability. However, a senior director from a city council commented that the difficulties and the resistance encountered when developing a BOT project were largely underestimated by these low-quality contractors. During the course of the interviews, at least five public sector managers revealed a disparaging attitude to their Chinese BOT contractors, due to their inabilities and general poor performances.

It was difficult to investigate the exact number of unqualified BOT contractors in this study. However, as the data from the central governments indicated, only a few of the contractors were qualified to undertake large motorway and water infrastructure projects. Some BOT expert officials from central and local governments were very critical about using BOTs in developing local motorway and water projects. One justification was that there were not enough qualified BOT contractors available to do the work.

Compared with the Chinese private contractors, the government-owned companies and the

contractors from Hong Kong and other countries were much bigger organisations, had wider experiences and many more skills in developing motorway and water BOTs. Finally, the weakest parts of the Chinese BOT market were its under-developed financial and legal consultation industries. Few qualified firms were available that could offer the necessary services to BOTs. Although there were hundreds or thousands of financial and legal consulting firms in China, only a handful of them had any experience of BOT projects. Even the 3 interviewees from the BOT consulting firms did not deny this finding. As one associate of a BOT legal consulting firm agreed that

Chinese domestic consulting firms largely differed in terms of their competence, capability, expertise and other resources. It was true that a handful of consulting firms were able to provide BOT advisory services, half of them being foreign companies.

A senior director from a Chinese legal consulting firm

The findings of this study presented that the governments in China actively promoted the implementation of BOTs in motorway and water sectors. However, the governments failed to consider if they had the necessary institutions and resources to do so. A key finding of this research is that a majority of BOT contractors, the financing institutions as well as the consulting firms, did not have the capabilities to carry out large water and motorway BOTs at the time.

6.4.7 The Constraints on China's BOTs: Absence of BOT related Laws and Regulations

The evidence from this study shows that both the public and private sectors in BOTs were restricted by the current Chinese legal system. The research participants who worked in top legal firms mentioned that when China was emerging from a command economy; the provision of public services by the private sector was not specifically addressed in the legal framework. For the private sector, the BOT contractors complained that the Chinese legal system insufficiently addressed the related legal matters.

‘There are few laws to address BOT issues in China... and by current laws actually you could not find a clear legal framework and such arrangements for BOTs... that has meant that private investors had large risks when investing in BOT projects in China...’

A manager from the legal consulting firm

Chinese regulations and policies on BOTs were frequently changed, notably when the Ministry of Construction adjusted the national quality standards on water supply and sewage treatment in 2006 without a public enquiry. Affected by this change, a large number of water BOT projects had to be re-designed, in order to fulfil the new government standards. A fixed rate return on investments (usually 16-20%) was adopted by local governments in many BOT projects to attract private investors in the 1990s. However, this policy and financial arrangement was abolished by the central government in 1998. As a result, hundreds of BOT contracts had to be re-negotiated with regard to the pricing and the unitary charges.

‘The government policies and regulations changed too quickly without any consistency, it caused large political and legal risks and losses for BOT contractors...it is harmful to long-term BOT contracts ...’

A legal consultant from a legal firm in China

Unclear BOT legal frameworks also increased the risks and costs to private investors and vice versa. The 4 managers from one BOT consortium noted that they had to spend a lot of time and money with their public partners to maintain a good relationship. If the present Chinese legal and law systems could not protect the private contractor’s interests, private contractors could make ‘under the table deals’ with officials to guarantee that the contractors’ interests and rights were not damaged. As a result, corruption was inevitably created. The interviews with all 4 private BOT sponsors showed that the Chinese investors often had no confidence in Chinese legal institutions, such as the local courts and judges, because of the special legal systems in place.

‘Chinese local government and local Communist Party committees had strong powers

and influences on the appointments of local judges...the independence, justice and fairness of the judgments of the local courts in China were often under suspicion by private investors.'

A director from a legal consultation firm

Therefore, when conflicts happened between the private sector and their public partners, the Chinese legal system made it difficult to protect private rights and guarantee a fair judgement. At the time of the interviews, given the independence of the Chinese legal system, the managers from the legal consulting firms commented that BOT contractors could submit a dispute to arbitration in Hong Kong and Singapore. However, these participants added that the costs and the expense of such arbitration were very high.

On the other side, this study found that the public sector was also bothered by the legal issues of BOTs. The status of BOTs had not been identified from a legal point of view. The related laws and Chinese governmental accounting system did not clarify whether the BOTs should be included in the local government balance sheet or off-balance sheet. Where the legal framework was inadequate and under-developed, there had been an increased focus on concessionary contracts as a means of enabling the government to enter into long-term agreements for the delivery of public services. However, this study found that even the local governments had no rights to sign a BOT contract within the current legal framework.

Another important problem for BOTs is that medium and small city councils with a population of fewer than 1 million, do not have not enough legal expertise to support the development of BOTs. Also, many officials had no legal background and do not consider the importance of laws concerning BOTs projects.

6.5 Summary

This chapter reveals that the implementation of BOTs in China's motorway and water sectors suffered as a result of a number of problems. Within the 23 cancelled BOT projects, the lesson learned, was that the public sector, as the main executor of BOT policy in China,

had not established the necessary institutional and policy frameworks for the programme to succeed. A number of local governments at city level had insufficient resources to conduct BOT projects properly. The majority of the interviewees from the city council complained that very limited support from central and provincial government had been given. Both the decision-makers and the BOT project managers had very little knowledge on how to implement a BOT in practice. Therefore, there were a number of practical difficulties surrounding the processes of preparation, tendering and bidding, contracting, negotiating and evaluating BOT projects. These study shows, at national and provincial level, that the government needs to set up a specific department to design, formulate, regulate and evaluate BOT policies and offer practical guidance on the implementation of BOT models. At same time, the interviews with managers from central and local governments revealed that the Chinese domestic BOT contractors also did not have enough finance or technical and managerial capabilities. The important factor for Chinese BOT contractors was the number of barriers and limitations between them and the government controlled banking and capital markets. With limited financial backing, Chinese BOT contractors often suffered as a result. Meanwhile, the technical, design and operational competence of private contractors was also in doubt. Private BOT contractors, notably, the Chinese domestic contractors did not have enough experience, skills, knowledge or resources to manage large infrastructure projects.

The implementation of BOTs was affected by national and local issues, such as China's incomplete legal framework and their industrial policy changes. Other problems arose with opposition from local residents and employees who worked in the public sector.

Many of difficulties of using BOT concessionary contracts to develop local motorway and water projects in China have been identified in this study. The major ones include high transaction costs, incomplete BOT contracts, opportunist behaviour on both sides of the contract, poor cooperation and relationships between the public clients and the BOT contractors and problems measuring the performance of BOT projects.

The lessons learnt during the implementation of BOTs in China's motorway and water sectors showed that BOTs were a useful long-term contract based approach to develop the local infrastructure. However, the BOT model needs to be improved in practice, in terms of

the potential benefits, costs and risks and the local authorities in China need to carefully consider and balance these factors. The lessons from the Chinese water BOT projects suggest that the BOT model may not be suitable for small sized projects. The governments also need to consider if the right conditions to implement a BOT exist, namely, the institutions and the resources (i.e. laws, regulations, experts and money) crucial for delivering and implementing the programme are in place. All of these factors are vital before the creation of a successful BOT project.

PART FIVE DISCUSSIONS AND CONCLUSIONS

Chapter 7 Findings and Discussions

7.1 The findings about the development and implementation of China's BOT

In the last two chapters, this thesis discussed the overall trends in the development of BOTs in China's motorway and water sectors. Chapter 5 presents the results of the implementation of motorway and water BOTs in six provinces. Chapter 6 then explored the problems and experiences of utilising BOTs by considering the institutional context and the contracting practice of local governments at city levels.

In terms of the performance of all projects involved in this research, the study highlights that the overall experience of the China's water BOTs is so far negative. Meanwhile, the results of implementing BOTs in the motorway sector are mixed but much better than those in the water sector. Some positive experiences have been discovered in some motorway and water BOT projects. However, these good practices were found in only a small number of cases (23 out of 96 projects). In addition, the findings revealed that BOTs are often used by the governments at city level as a 'buffer' to postpone their fiscal crisis and administrative problems. The real motivation of implementing BOTs for the city governments is fairly short-term objective driven with political target-oriented policies (to increase GDP indicators, fulfil the infrastructure gap and to fulfil the national plans required by the ministries of the central government).

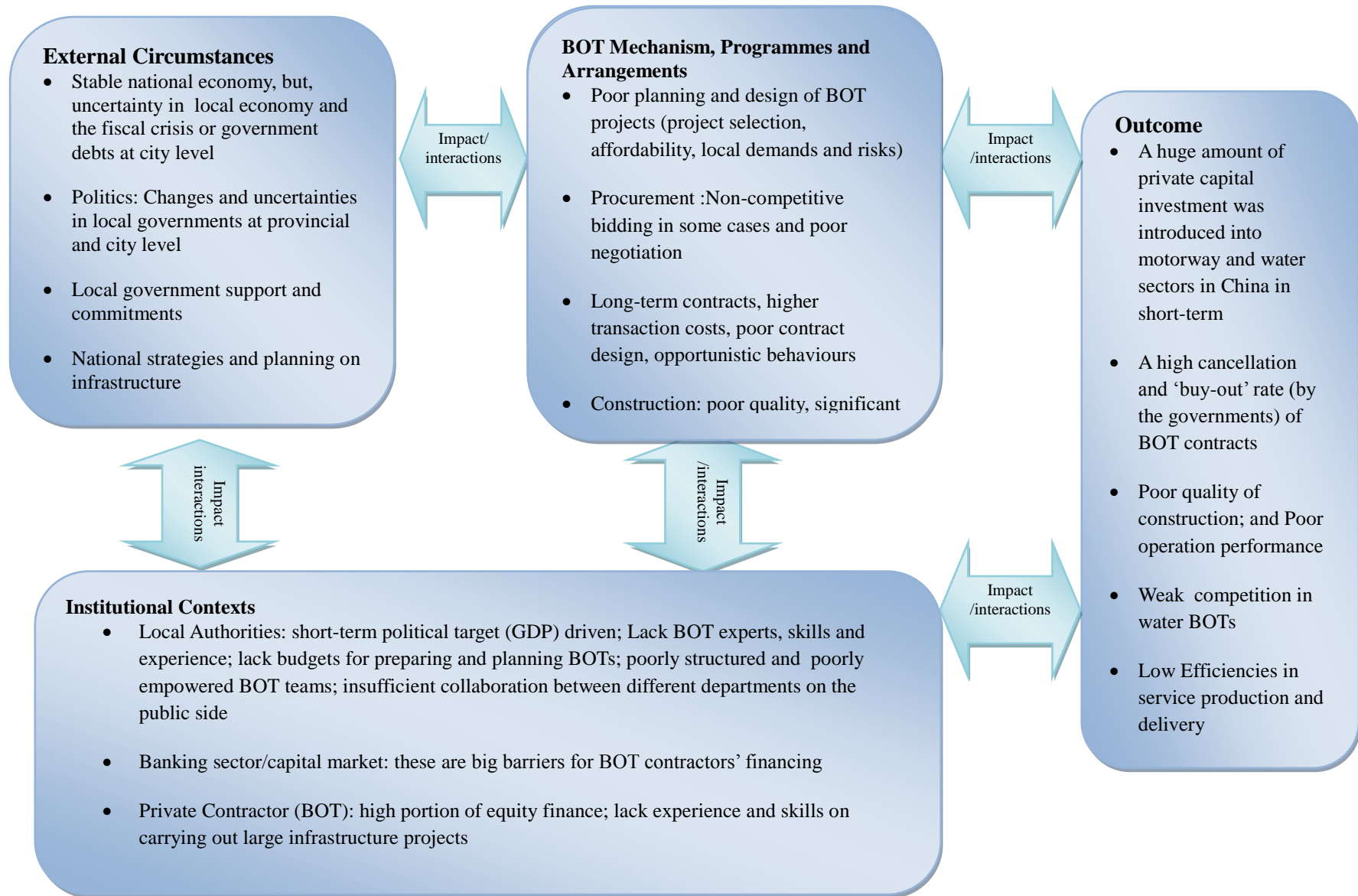
In this study, the weaknesses of BOTs have been discussed. They are based on long-term contracts, e.g. with high transaction costs and inflexibility. In practice, there are also a large number of other problems which can cause the failure or cancellation of BOT projects. These include, the contributing factors from Chinese BOT governance institutions, BOT related industries, legislation and social-economic issues. This research noted that both governments and private contractors in China are not really in a position to undertake BOT projects, in terms of their capability, experience, skills or financial resources. Moreover, BOT related industries in China are not well developed and are unable to sufficiently offer technical, financial and legal support to the application of BOT projects. Finally, the development and implementation of BOT's also suffered as a result of the changes in national and local economies, politics, public reforms and infrastructure developing

strategies.

Putting all of these findings together, Diagram 7.1 represents

- How BOT projects work?
- What were the results of implementing BOT projects?
- What contributory factors drove the projects to failure (or success)?

Diagram 7.1 The Failure of China's BOT Model in the Motorway and Water Sectors



7.2 The findings on comparing Chinese BOT projects and British PFI schemes: the similarities and differences

Given the findings on the development and implementation of Chinese BOTs, a comparison between BOTs and the PFIs in the UK is presented. Table 7.2 (page 290) shows the major similarities and differences between these two policies and their practice, in terms of objectives, context, development levels of their associated markets and industries, the results of BOT and PFI implementation and finally practical and emerging issues.

Table 7.2, establishes some similarities between BOT and PFI schemes and their practice, including same contracting methods, similar models, comparable objectives, similar ideologies underpinned by the programmes and familiar problems with contracts. Significant differences were observed in areas of institutional context and related industries and also in the fields of government and private contractor capability, BOT governance institutions and structures. Although there are many detailed similarities and differences that can be discussed, this section emphasises several important points by which comparison of the two is relevant.

7.2.1 PFIs and BOTs as long-term contract projects

Firstly, it is significant that both BOT and PFI suffered as a result of using long-term contracting method in practice. This finding indicates this as a weakness of both BOT and PFI models as shown by the Transaction Cost Economics. No matter how the context differed between the UK and China, BOT and PFI were inevitably affected by these contracting issues. Common issues were that BOTs and PFIs both have higher transaction costs, incomplete and inflexible contracts, opportunistic behaviours of both parties within the contract and a lack of expertise and skill in the public sector to manage long term contracts for the delivery of public services.

However, as this study shows, China and the UK chose different ways to deal with these contracting problems. In China, a large number of city authorities tried to reduce the transaction costs associated with BOT transactions. Notably, Chinese local governments attempted to conduct very brief outline business cases plus very simple project planning and design without recruiting external advisors. In this way, the governments reduced the

transaction costs in the BOT planning and preparation stages. Governments at city level do not recruit financial, legal and technical advisors in the procurement, bidding and negotiation phases. As a result, the contracting costs of BOT projects were significantly reduced in these cases. Finally, full-time project managers on the governments' side were not appointed by the local councils to regulate and monitor the performance of BOT contractors. All of these measures significantly reduce the transaction costs of BOT, whilst resulting in poor project selection and planning, higher risks of private contractors' failure, a very high cancellation rate of BOT contracts and higher operational costs at later stages. Without careful and robust project selection, planning, procurement and tendering work, a number of BOT projects eventually collapsed at very earlier stages.

The governments in the UK adopted a different approach to handle the transaction costs associated with PFI. The key approach used by the government is one of standardization and the Treasury's PPP unit has published four versions of the PFI Standardized Contract Models in the last ten years. One of the purposes of the PFI contract's standardisation is aimed to make PFI contracts more complete and unified, thus reducing the cost of contract drafting. Secondly, the government attempted to standardize the procedures and practice of PFIs. They issued a range of guides on the planning, procurement and tendering processes of PFIs, in order to mitigate the transaction costs in these stages. Finally, the government in the UK advocated the concept of long-term partnership between the public and private sectors, and attempted to build a strong contract relationship, eventually reducing 'opportunistic behaviour' in PFI transactions. However, it is difficult to evaluate the real effects of attempts to build relational PFI contracts, since robust evidence has not been observed in the UK. In contrast, negative experiences have been found in some cases as the NAO explored (NAO, 2009b, 2011).

7.2.2 BOT and PFI: their similar official objectives, but different priorities

By looking at the official objectives of using BOT and PFI the governments in both China and the UK anticipated that they would need to introduce private capital investments, transfer risks and improve the efficiency of public services and management. However, in practice it was observed that the priorities of BOT and PFI differed quite a lot. The PFI

scheme is largely based on the concept of ‘value-for-money’. The BOT in China largely concentrates on maximization of private investment capital. The different priorities of these two schemes led to quite different attempts to use private capital. In China, to attract private infrastructure investment in a short-term period, local governments at city level often ignored and thought little of the long-term benefits and issues of using BOTs. The Chinese local authorities’ main concerns were how to introduce private capital investments as soon as possible to solve their current fiscal crisis and political problems. In contrast, PFIs attempted to put more consideration on ‘whole-life costing’, the transfer of risks and value-for-money tests. Meanwhile, PFI in the UK also suffered as a result of short-term oriented objectives due to the accounting treatment incentive and budgetary pressures, e.g. the shortage of public finance for infrastructure and the use of PFI as an off-balance finance.

7.2.3 Different social-economic contexts in the UK and China leading to different practices

It is difficult to say that China’s approach to using BOT is wrong, or that the British approach to implementing PFI is better. As this study explores, the contexts in the UK and China differ largely. Therefore, the governments in China and the UK face different challenges in developing infrastructure projects. For China, the local governments need to develop urgently needed motorway and water infrastructure as soon as possible to respond to the rapid urbanisation within the country. However, for the UK, the governments have more pressure to update ageing facilities and demands for better public services to maintain the current public infrastructure.

It can be seen that both the governments in the UK and China adopted pro-market and neo-liberal ideologies in developing public infrastructure and services. However, the histories and experiences of using the market-mechanisms of the two governments are quite different. The government in the UK has extensive experience and lessons of using market-oriented methods to deliver infrastructure projects and provide public services, e.g. large scale privatisation, contracting-out and the use of PFIs in the public sector during the last three decades. Conversely, China has little experience and only a short history of private sector use in developing infrastructure projects. Both the government and private contractors in

China still do not have the necessary experiences, skills, resources and capabilities to properly perform BOT projects. Finally, given the large number of BOT projects undertaken by domestic investors, this study discovered that the contractors had little experience and competence to do the works. In only a few of cases, were BOT contractors able to properly carry out the projects with the necessary finance and experience to manage a super-large infrastructure project. In these cases, the BOT contractors happened to be the publicly listed corporations which were owned by the state.

In addition, the development of the private economy is quite different between the UK and China. The Chinese private economy has developed rapidly in the last three decades, although it is still weak and very much a supplement to the state-owned economy. As shown in table 7.2 at the end of this section (page 290), the private sector played a very limited role in the Chinese capital market, banking industry and infrastructure industry. All these fields are tightly controlled by the state-owned enterprises. Therefore a Chinese BOT scheme is difficult to implement without the backing of a strong and mature private economy.

This study does reveal that China's central government had hoped to improve the efficiency and effectiveness of building, financing and operating infrastructure and public services by using BOTs. However, the development and implementation of BOT at provincial and city levels is challenged by several issues including a rigid and bureaucratic public administration, an undeveloped private economy and various underdeveloped BOT related industries.

Compared with BOTs, the British PFIs met different challenges and issues. The UK has a long history of capitalist and market-oriented economies. The construction, banking and accounting industries were very much concentrated in a small number of multinational companies. As has been discussed in chapter 3, the medium and small companies find it difficult to get involved in the PFI markets. Furthermore, when dealing with these highly skilled PFI private contractors, the government often found itself at a disadvantage. The NAO (2009) commented that the government needs to get smarter when buying into PFIs. The findings of the Public Account Committee (2011) have shown that the private contractor always gained more benefit from PFI deals than did the UK taxpayers. For the

governments in the UK, the key issue is how to get a better PFI deal, in order to achieve 'value-for-money' for the taxpayers.

7.2.4 Management practice of BOT and PFI: decentralisation vs. centralisation

This research indicates that the governance structure of Chinese BOTs is highly decentralised. The governments at provincial and city levels can make their own decisions on whether to adopt the BOT model or not. The provincial and city governments also are able to issue their own BOT policies and circulars. The central government in China has retained only very limited control on the development and implementation of BOTs since 2005. This thesis highlights the geographical and economic differences amongst the provinces of central and eastern China with those of the western provinces. These differences have resulted in a centralised and standardised BOT system being very difficult to establish by the central government. For instance, the area and population of the Guangxi Minority Autonomous Region in China is equivalent to that of the UK. China has 27 provinces, 5 minority autonomous regions and 2 special administrative regions. In fact, at least 15 provinces in central and eastern China are equivalent to the whole of the UK in terms of area and population. This is another reason why it is impossible to establish a centralised and standardized BOT framework in China. Therefore, most of the BOT projects were conducted at city level in terms of their own initiatives and decisions.

In China the system of BOTs originally worked from the bottom up. i.e. provincial governments initially introduced and used the BOT model. Then, the central government of China centralised the approval and management processes during the period from 1994-2004. However, the highly centralised management of BOT usage met a number of challenges, such as the resistance of local governments, complicated and time-consuming approval procedures and a lack of consideration of local factors. All these difficulties with centralised BOTs resulted in the national government finally decentralising management to provincial governments in 2005. However, this study found that this decentralisation caused new problems for local BOT management. One of the problems is that local governments do not know how to properly regulate and inspect BOT projects and their contractors. In

many cases, the management of BOT projects was often kept at ‘arms length’. Local governments at city level generally knew little about the performance management of BOT contracts.

In contrast with the experiences in China, the PFI in the UK adopted a highly centralised and standardised approach. Firstly, a PPP unit was established within central government to manage the PFI’s development, e.g. designing and formulating PFI policies, publishing technical guidance and approving some applications from local PFIs (Treasury, 2009). Secondly, both the central government’s ministries and the local councils followed certain procedures (14 steps) and standard practice when the PFI model was employed (Allen, 2003), with the Standardized Contract Model being an example of this. Finally, the central government in the UK highly advocated the standardisation of PFI practice and still retains substantial roles in the use of PFIs. For instance, the government urged the ministries and local authorities to employ the Gateway Review, the Green Book and the ‘Value for Money’ tests in practice. Furthermore, the NAO, the Audit Commission, the Public Account Committee and the Economic Affairs Committee, all actively reviewed and inspected the performance of PFI contracts. The most significant feature of PFIs in the UK is that they are highly centralised and standardised. The UK also worked from the top down to develop PFI policy and manage PFI practice, which is in fundamental contrast to the Chinese BOT decentralised, ‘arms-length’ and working from the bottom up approach.

7.2.5 The relevance of BOTs and PFIs

Based upon the analysis mentioned above, it is difficult to say how the experience of developing and implementing British PFIs is relevant to China’s BOTs despite the fact that the two models are very similar and comparable. However, the governments in China and the UK may use these similar models but to solve different problems. In other words, the key purposes and motivations of using BOTs and PFIs differed between China and the UK. China use BOTs as a financing tool to urgently raise the much needed infrastructure capital investments, in order to fulfil the infrastructure gap. The UK employed PFI as a way to improve public infrastructure and services’ management, finally achieving value for money for the taxpayers (although the final results are still controversial). If these two schemes had different purposes, and operated within different contexts, the final outcomes are inevitably

different. Therefore, the overall experience and lessons of using PFIs in the UK are not always relevant to those of Chinese BOTs.

However, as this study explored, some experiences and lessons of the practical and development issues of using PFIs can still be learnt by the Chinese governments, e.g. the use of a long-term contract to develop an infrastructure project. As presented by table 7.2, all similarities between the two schemes exist in the areas of contracting practice. In some provinces where BOTs were employed on a much larger scale and with relatively longer timescales, some elements of PFI practice were still relevant. Since the Chinese BOT projects are fairly well concentrated in a small number of provinces, this study suggests that these provinces have the potential to learn from the experience of PFIs and improve their BOT practice in the future. In the next section, this study will address these lessons and how they will be useful to the development and implementation of Chinese BOTs in the future.

Table 7.2 A Comparison of PFI in the UK and BOT in China

Items and Factors		
Definitions (PFI and BOT)		
	British PFIs	Chinese BOTs
Concession Contracts	Yes	Yes
Maturity of Contract	About 30 years	No more than 30 years
Bundling Design or Not	Yes	No (But, found in some large water BOTs funded by multinational contractors)
Payment Mechanism	Governmental Annual Payment or Unitary Charges (Direct Tolls were also found in a few road and bridge cases)	Direct Tolls, 'pay-as-you-go', (In some cases, the public sector paid)
Objectives (claims)		
	British PFIs	Chinese BOTs
Mobilizing private investments	Yes	Yes (Key Objective)
Risks Transfer	Yes (key objective)	Yes,
Value-for-money Or three Es (Efficiency, Effectiveness and Economy)	Yes (key objective)	The governments claimed 'efficiency improvement'
Private management, skills or advanced technology (Innovations)	Yes (key objective)	Yes
Contexts and Backgrounds		
	British PFIs	Chinese BOTs
Neo-liberalism or pro-Market ideologies	Yes	Yes, the government enthusiastically promotes marketisation of infrastructure and social services
Fiscal difficulties and shortfalls of the governments	Yes	Yes, significant fiscal crisis (infrastructure investments shortfall) at city levels
Increasing social demands/updates on aging facilities/maintain pressures	High	Very high (the real extent needs study)
Other alternatives		
- Budget finance	Yes, but there is institutional bias, especially in NHS and Schools	Yes, but difficult to apply
- National Development Bank	No	Yes, but only cover a small demand on developing infrastructure
- Local Government Bonds	No.	Yes, poor effects from the pilot

		tests
<i>Development Levels of PFI markets and private industries</i>		
	<i>British PFIs</i>	<i>Chinese BOTs</i>
Capital Markets	Well-developed overall (but, severely weakened in 2008)	Little support to BOT contractors
- Corporate Bond market	Well-developed	In developing, offer some support to BOTs
- Stock market	Well-developed	Few services designed for BOTs
- Insurance market	Well-developed	
Banking Industry	Well-developed	Well-developed (state-owned), very limited efforts made for BOT debt financing
Construction Industry	Well-developed	Well-developed (state-owned), private contractors' competence is really poor
Consulting Industries		
- Financial	Well-developed	Less than 10 qualified firms
- Legal	Well-developed	A few qualified BOT legal firms
- Technical	Well-developed	Over 10 thousand state-owned design and planning institutions, few private firms
Capabilities of private contractors	Relatively strong	Over 95% of Chinese water BOT contractors have very poor financing, management and technical capabilities A large number of BOT contractors and sub-contractors have not sufficient capability to commence projects
<i>Facts of the Implementation</i>		
Scope	Central and Local Level	Local Level only
Procedures	14 Steps	9 steps, the procedures are similar to PFI, but no uniform and standardized guidance on how to conduct these steps.
Specified and unified PPP units in the central government	Yes (PPP Unit, H.M. Treasury)	Not found at central level (decentralised), Some infrastructure project management departments were found at provincial and local level, not specific with BOTs
Policy and Regulation Framework	Relatively complete	A few policies and regulations have been issued
Standard Contract Models	Yes	Yes, but only for Water Supply Sewage Treatment and Solid Waste Treatment sectors

Complexity	High	High
Issues, Results and lessons related to Implementation		
	British PFIs	Chinese BOTs
Degree of Transparency	Low, but higher than China's	Very low
On-balance sheet	Not yet	No, there is no accounting interpretation or practice in the public sector. Some interviewees believed BOT is an 'extra-extra budget' finance
Achieve Value for Money of taxpayers (or Efficiency, Effectiveness and Economy)	Controversial and inconclusive, but failed in many cases	Efficiency (large cost reduction in motorway BOTs, but poor quality, design and planning) Effectiveness (a large amount of private capital investment introduced in the short-term to postpone the fiscal crisis, but long-term fiscal risks are maybe higher) Not economic, some contracts are expensive and with high transaction costs
Risks Transfer, allocations and premiums	Controversial, probably a few risks transferred, but with high premiums	The governments attempted to transfer all risks to private contractors, resulting in an expensive contract, or project failure, cancellation and buy-out by the governments, or some risks were transferred back to the governments
Transaction costs	High	High in some projects, However, the governments attempted to cut these costs without hiring BOT advisors, resulting in higher 'operational risks and costs' at a later stage.
Incomplete Contract	Found in many cases	Yes, in many cases
Contracting risks (opportunistic behaviours, hold up and lock in)	Found in many cases	Yes, in many cases
Relationships/Cooperation	Poor or inconclusive	Poor, but in some cases, a good relationship between project managers and contractors may create opportunities for 'corruption'

Contract Management and Monitoring	Poor or inconclusive	Piecemeal or laissez-faire approach
Expertise, skills and Training	Insufficient in public sector	Insufficient in public and private sectors,
Degrees of competitions in procurement and tendering	Seems to be weaker with poor competition at post-contracting stages	Poor in water BOTs' procurement and bidding, poor competition at the post-contract stage
Overall performance and effects	Inconclusive and controversial	Mixed results in the motorway BOTs, and negative in water BOTs

7.3 Discussion: BOT problems and PFI's lessons—what can the Chinese learn?

7.3.1 What caused the problems with BOTs: the weaknesses of the implementation of the BOT model in China's motorway and water infrastructure sectors

Whilst much of the policy content between British PFIs and Chinese BOTs is different, some of the operational and emerging issues are the same. It is possible for China to study the problems of PFI implementation to solve the issues they meet in BOT practice. The biggest issues for China are the high cancellation and buy-out rate of BOT contracts and their poor value for money. There are various causes which have contributed to the problems of using BOTs.

As this study has revealed, BOTs have various weaknesses in developing road infrastructure and water services. The major ones include the following:

Low transparency of BOT contract and relevant information was found in all of the motorway and water projects. This information was obscured by the governments and private contractors in accordance with the requirements of commercial confidentiality. This low transparency of information ensured that BOT projects were not inspected by the public or by other departments of the government. Inadequate disclosure of information on current projects also made it difficult for the public and the governments to conduct evaluations on the real performances of BOTs. This may also help to cover up corruption activities happening within BOT projects.

As discussed in a number of sections in this thesis, the fundamental weaknesses of the BOT model revolve around the contractual problems and risks associated with long-term BOT contracts, e.g. higher transaction costs, inflexibility of the contract in practice, incomplete poorly defined contracts and their clauses as well as the opportunistic behaviours of the governments and private contractors. The development and implementation of BOT projects in China suffered as a result of these issues and viable solutions have yet to be found by the governments.

Poor practices and management on the BOT's planning, procurement, tendering, negotiating and regulating stages were also observed in all ten cities. These involved more practical weaknesses and emerging issues of using the BOT model including:

Poor decision-making on BOT's adoption and any alternative procurement routes: in many cases of motorway and water projects, the BOT model was wrongly adopted in unsuitable projects. The findings of this research also reveal that under-prepared agencies and departments in city governments adopted weak project planning and design work practices. This was due to a lack of experience or professional resources available in-house at city councils and also limited financial budgets preventing the local councils from recruiting in adequate professional advisers. This was because the governments tried to minimize the transaction costs involved in the planning and design of BOT projects. In addition, preliminary feasibility studies and outline business cases were conducted with insufficiently detailed design briefs. The preparatory work of BOT projects was often done by poorly resourced public sector managers within insufficient timescales. With poor design and weak project planning, many BOT projects, particularly for water supply and sewage were put out to tender, causing a number of problems in the later stages e.g. Uncertainty on project costs in the procurement stage, re-design and major revisions of projects, delays and poor quality project construction, poor performance and higher maintenance costs in the project's operation and finally, significantly increased overall risks.

Contrasting with the PFI model in the UK, the design of most BOT projects were undertaken by the city councils or their agencies in the very early stages. This was because city councils often did not trust the design capabilities of private contractors, or that projects were expected to be funded by government budgetary finance. However,

government designed BOTs did have some weaknesses. Private contractors were totally excluded from the design work of BOT projects which constrained their experience and innovation in the design and construction processes. In some large water BOT projects, the most experienced and competent contractors had to fundamentally change the design, which incurred further extra costs.

The weaknesses of the BOT model in the procurement and tendering processes are also significant. Firstly, there are too many government departments involved in BOT approval and governance increasing the complexity and costs of using private finance in infrastructure projects. These departments were not wholly integrated into the approval and procurement processes, which meant that the procurement was unnecessarily long, and with higher costs that finally led to a delay in the project construction.

Another practical weakness of BOT is its higher bidding costs. Evidence from the city councils highlighted that both BOT contractors and the local governments were really concerned by the excessive cost of financial, legal and technical services.

The third weakness of using BOT procurement and tendering is poor competition. Particularly for the small water and sewage projects, non-competitive bidding was often adopted in a number of cases. The problems of non-competitive bidding have been discussed in previous chapters, notably, low transparency in the process, risk of corruption and expensive contracts.

Fourthly, the procurement of BOTs often took too long and suffered from a number of uncertainties and changes by local governments and contractors resulting in delays with construction and operation. There are a number of reasons for a lengthy procurement process, including the lack of a standardised and detailed procurement framework, inadequate and poorly designed output specifications for projects in feasibility studies, and poor negotiating skills within the authorities. Some city councils attempted to speed up the procurement and tendering processes. However, some BOTs were contracted out too quickly by the governments, leading to many vital issues of the BOT contract not being fully considered and researched by the governments and the contractors, e.g. risk allocation, project output specifications and detailed contract clauses.

Fifthly, both the government and private contractors failed to provide sufficient accurate

information in the procurement and tendering phases. Both parties (governments and contractors) attempted to give misleading information to achieve advantages over others. Finally, the procuring departments and the BOT teams seemed unable to select the right bidders. This was due to a lack of criteria for bidder selection, insufficient relevant skills and experience of the BOT teams, the underdeveloped credit check system in China and lack of concern on the real competence of BOT bidders.

The problems of using long-term contracts have been discussed, and some practical issues have been explored in this research, e.g. risk transfer and allocation, and the output specification. The governments at city level attempted to transfer the risks associated with the BOT as much as possible, rather than to allocate them to the parties of the contract to manage. This study also emphasised that the governments and their managers were not able to write complete output specifications into their contracts, leaving them incomplete and difficult to enforce.

One of the emerging issues of using the BOT model in the Chinese motorway sector is the poor quality found in their construction. This issue may be caused by a number of contributing factors as mentioned above, e.g. poor planning, design and low-quality contractors. However, this study presented two other factors which are also important. Firstly, the main contractors need to enforce vital quality control on the sub-contractors and material suppliers but continue to emphasise cutting costs. Secondly, the governments at city level did not conduct proper inspections of projects, probably because of the low transparency of costs and lack of supply chain information of BOT contractors. The governments did not know how much money was being spent, as this information was essentially confidential. In addition, the operational performance of the water and sewage projects was very poor. The main causes of this were the poor design and planning during the early stages, as well as the inadequate government evaluations at the post-contracting stages.

For the governments in China, especially those at provincial and city levels, the urgent and immediate tasks were to improve their BOT practice by addressing the weaknesses and emerging issues mentioned above. Some experiences and lessons from PFIs may be relevant to BOT practices. However, some might not be applicable to China's BOT practice,

due to the local governments in China not having sufficient capabilities and resources. Meanwhile, it is possible that the PFIs in the UK had suffered from similar issues that affected BOTs, and that solutions to these were also unavailable in the UK. This section looks at what lessons China can learn from the UK including what it needs to adopt or adapt and what it needs to avoid.

7.3.2 Transaction costs of using long-term contracts and the lessons learnt from PFIs

The transaction costs of using BOTs are high, as this research has already highlighted. However, the public sector managers in Chinese city councils do not fully understand the relationship between the success of a BOT project and the transaction costs. Informed by the lessons and experiences of British PFIs, transaction costs are unavoidable (The Treasury Committee, 2011, NAO, 2005, 2008, Pollock et.al, 2003, Edwards, et. al., 2004). These are the costs of using long-term contracts and cannot be easily eliminated. There is a consensus amongst the governments and academics in the UK that PFI is an ‘expensive’ method by which to develop public infrastructure and social services (Dixon et. al, 2001, Whitfield, 2007, NAO, 2009, The Economic Affairs Committee, 2009, the Treasury Committee, 2011). Due to its higher transaction costs, the PFI model is not suitable for all projects, particularly small ones (Treasury 2003) because their transaction costs (e.g. bidding costs and financing costs) are relatively higher and cannot be offset against the benefits that PFIs bring in.

In terms of the transaction cost perspective, the lessons of the UK showed China that not all projects can be developed by using private finance. Depending on the size, value, industries and return on investments of an individual project, the local governments in China need to be very careful when selecting the BOT model for motorway and water projects. The governments need to consider what the potential benefits and costs of using BOT are in the long and short-term and what potential costs and risks are involved for a particular project. When the governments consider adopting the PFI model, they need to evaluate if the potential costs of PFIs are able to be traded off against the benefits that they bring in. PFI also needs to be compared with other procurement routes, e.g. publicly-financed projects. The UK adopted a system in the public sector to compare and help the public agencies and authorities to make decisions on whether to employ PFIs or not in a public infrastructure

project. This was a good attempt to try and justify that PFI is better than alternative procurement policies. However, as discussed in chapter three, the experience of using Public Sector Comparators is controversial in PFI appraisal and decision-making because of its inaccuracies and flaws. The Public Account Committee (2011) argued that the use of PFI had been based on inadequate comparisons with conventional procurement processes and had not been sufficiently challenged. At the same time, some scholars (Coulson, 2006) argued that in value for money tests, the governments in the UK had also underestimated the transaction costs incurred by the PFIs. A large number of transaction costs were excluded in the decision-making process, particularly involving Public Sector comparisons. This resulted in a large number of projects passing through the tests but not achieving real value for money later. The PAC (2011) argued that PFIs were used in the past, but without clearly proving whether they provide value for money. These lessons helped China to understand that decisions on adopting the BOT approach needed to be made by public procuring bodies and that transaction costs are an important consideration of the decision. Underestimating the costs of BOT projects would lead to unsuitable projects being selected and eventual failures in the later stages.

The lessons of using PFIs also showed China that the transaction costs associated with BOTs can be mitigated through standardising procedures, publishing standardised contract models and adopting of a relational contracting practice. The standardised procedures and PFI contract models can mitigate the costs of PFI deals, since similar PFI projects would follow this practice. By considering the capabilities of Chinese local governments, the experience of standardised PFI practices are relevant to BOTs, though not to all provinces in China.

The barriers to learning from the UK include the large geographical and economic differences that exist in the provinces of China, as well as highly decentralised BOT governance structure. The Chinese central government therefore found it difficult to standardise the implementation process and contracts in all 34 provinces and regions. A highly standardised BOT practice may affect the flexibility of the implementation process and underestimate the impact within the local context of an individual project.

However, it is possible that the governments at provincial level could establish their own

standardised BOT procedures and contracts by addressing local contextual factors. In provinces with a large number of BOT contracts and with available BOT experts, the experience of PFI standardisation could be a useful asset. This would be in terms of the local government's institutional resources, capabilities and commercial skills. Some provinces in China may have a large number of BOT contracts being implemented, but do not have the necessary BOT experts and financial budgets to establish a standard framework or to publish their own standardised contracts.

As discussed in this section, both BOT and PFI models suffered as a result of higher transaction costs during their implementation which is the biggest weakness of the BOT and PFI models. Standardisation of PFI contracts and practice may mitigate some of the costs in a project, but this lesson is only relevant to certain provinces in China.

7.3.3 Building a relational BOT contract: the experience and lessons from the PFIs

There is also another way to mitigate the costs of BOT transactions, as PFI's experienced and that Transaction Cost Economics recommend. This is by establishing a relational BOT contract between the public authorities and the BOT contractors.

The central finding of this study is that about two-thirds of motorway and water BOTs experienced conflicts between the local government and the BOT contractors. These conflicts largely increased the cost of using BOT contracts in practice. The main reason for the formation of these adversarial relationships between government and BOT contractor is the opportunistic behaviour shown by both parties of the contract. The motivations and incentives of the participants in BOT projects, were 'profit-driven' or politically 'target-driven' in the short-term. The unbalanced structure of China's BOT contracts also led to private contractors often being locked into BOT contracts by the local authorities. Opportunistic behaviour and the low trustworthiness of local governments and BOT contractors significantly increased the transaction costs and the projects' risks which eventually led to the project being cancelled. To the governments in China, the important issue is how to minimise the opportunistic behaviours in BOT transactions and reduce the risks of project failure and cancellations.

According to the PFI experience, a good relationship between the public and private sector

is helpful to mitigate the transaction costs of BOT contracts. The lessons from the British PFIs highlighted that the public sector and private contractors should build good cooperation if (Treasury, 1999, 2006; the NAO, 2001; and the OGC 2002):

- *both parties of the contract have an understanding of each other's business and a common vision of how best they can work together as partners.*
- *there exists a clear and well-designed contract which includes allocating risks appropriately, establishing clearly defined quality of service and value for money mechanisms and building in arrangements to deal with change in the future.*
- *the project has BOT directors and management staff with the right skills and in-depth knowledge critical to good contract management.*
- *Finally, high openness on project information and good communication between the contractor and the governments.*

The research has shown that not all public clients and private contractors have built up good cooperation and a long term relationship as the government had hoped. The experience and lessons needed to build a relational PFI contract in China are difficult to apply, because although the concepts used in the UK seem easy when discussed, in practice they are not. Chinese governments at city level always put the emphasis on the short-term benefits of BOTs rather than the long-term ones. In these sorts of examples a relational contract is difficult to establish.

As mentioned in the last section, city councils in China were normally unable to design a high quality BOT contract to include an appropriate risk allocation and well-defined output specifications. In addition, open transparency for project information is difficult in practice, since both the governments and private contractors need to keep certain information confidential. The governments in China are only able to offer more training for their managers to gain more skills and in-depth knowledge on BOT contract management. The communication between governments and contractors needs to be enhanced in the future, which would be beneficial to improve the BOT contracting practice.

The lessons of using PFIs also indicated that not all public clients and private contractors had built good cooperation and a long-term relationship as the government had hoped. The NAO (2009) explored that the relationship between the government's PFI teams and private

contractors are just ‘them and us’ and ‘purchasers and suppliers’.

7.3.4 Building an effective BOT management structure at provincial and city government level: relevant experiences from PFIs

The findings of this study suggest that there were many challenges for the public sector when using the BOT approach. The major one is the lack of effective administration and technical support during the implementation of BOT policy at city level. Provincial and central governments manage the Chinese BOT programme very much at ‘arms-length’. This means that the governments at city level have to find the right methods of using a BOT policy by themselves. Experience gained in the UK highlighted the importance of the PFI governance framework, including the support and cooperation between different departments and public bodies, e.g. a PPP unit in the Treasury, Partnership UK, private finance units in line ministries (e.g. the Highways Agency) as well as the NAO. The World Bank (2003), Qin and Yu (2005) and the Asian Development Bank (2005) highly recommend setting up a centralised BOT unit at central government level within the existing government structure. This is based upon the experience gained from the UK. By considering the lessons and experiences of PFI projects (PUK, 2009, Bates, 1997), the potential benefits of creating a BOT unit can be itemised as follows:

- *more technical support to the policy’s implementation for BOT projects,*
- *providing more guidance material and best practice on reviewing BOT projects’ development,*
- *strengthening project management and practice*
- *a better development and quality control of contract standardization and risk transfer strategies by considering BOT practice,*
- *more relevant support to city councils who are going to use BOTs*
- *more BOT training for governmental staff,*
- *improving lessons learnt and exchange experience within the BOT network,*
- *more transaction support to individual BOT projects with detailed and relevant solutions*
- *more support to the procuring authority with the selection and management of BOT advisors,*

- *better quality control of projects,*
- *better responses on the operational and emerging issues of the development and implementation of BOT projects in local areas.*

However, this study argued that these recommendations might be difficult to realise in China. According to evidence from previous BOT applications, the National Development and Reform Committee in central government rigorously controlled the development and implementation of BOTs during the period 1994-2004. However, this highly centralised BOT governance structure did not work very well in those ten years, notably its low efficiency, poor effectiveness, lengthy processes and high bureaucracy. The significant weaknesses of centralised BOT governance are the lengthy approval and decision-making procedures, bureaucratic management and complicated processes of BOT applications which result in addressing little of the local context plus very high costs to BOT investors. Therefore, this study argues that a proposed BOT unit at the central government level is likely to repeat the past mistakes of managing Chinese BOTs.

To improve the effectiveness of BOT management, China may learn a few relevant lessons from the highly centralised PFI system. For Chinese provincial and city authorities, a dilemma of managing BOTs is that the governments have to retain some control on projects, whilst giving certain freedom to private contractors. However, if the governments rigorously controlled the approval and procurement of BOTs, it would result in higher costs, bureaucracy issues and lengthy and complex BOT management. In contrast, if ‘hands-off’ management were to be adopted by the governments at local level, there would be the possibility of losing control of projects. It is difficult to say how relevant the experience from the UK is for this issue.

However, PFI’s early experiences may be relevant to BOTs in China (e.g. Bates Review on PFI, 1997, 1999). The provincial governments in China need to review the current BOT administrative framework and procedures, in order to find out which public bodies should be involved in a BOT project and which should not. They also need to identify which department should do what kind of job. Roles, authorities and responsibilities of different institutional bodies on the public sector side in a BOT need to be assigned and streamlined, in order to reduce bureaucracy and avoid disorderly management. Local governments are

also able to make other improvements on the BOT governance structure, in order to improve the effectiveness of BOT management and adoption of the BOT model at local level. However, all these adjustments and improvements need to address the local context and available resources held by local authorities.

This study highlighted that in a few provinces, it would be helpful to establish a BOT unit within the provincial council or in the provincial Development and Reform Commission. This is because the current BOT governance structure and framework in these provinces is not able to handle the increasing number of BOT projects being implemented. To achieve better management of privately financed projects as well as developing appropriate strategies and policies for the future, a BOT unit at provincial level is vitally important.

However, there are still some potential costs and barriers to establishing a unit of this kind, as this study reveals. Firstly, the provincial governments need a large number of BOT projects in the procurement process and in operation to justify the costs of creating and operating a BOT unit. The unit should not be built until there is a definite strong need to do so (e.g. having a large number of BOT projects to manage within the existing structure). Secondly, the provincial governments need to raise a considerable amount of money to establish a BOT unit. Thirdly, the governments at provincial level need to attract and recruit a number of BOT experts and specialists from the market. Fourthly, the provincial councils need to make a strong political commitment and have plans for developing and applying the BOT model in the long-term future. Finally, the political costs and risks of a structural change in the provincial governments need to be considered. This is because the creation of a BOT unit may have a major impact on the current management and power structure within the governments. Some departments may lose their participating powers in the large infrastructure projects and some departments may get more authority in managing BOT projects. Based upon the above analysis, it can be seen that a BOT unit at provincial level may bring certain benefits in terms of project management though not necessarily for all provinces and regions in China. By considering the number of BOT projects locally, the availability of associated budgets and BOT expertise in local markets, and the long-term strategies and commitments of the local governments on developing BOTs, this study estimated that only four provinces in China have the potential to establish a BOT unit

within their governments.

Another good example of PFI management is that the NAO and the PAC of parliament are heavily involved in the evaluations of the implementation of PFIs. Lessons, best practices and subsequent recommendations have been made in order to secure value-for-money in PFI projects as well as to inspect PFI's performance and any emerging issues. This good practice from the UK can be transferred to China, since evaluations and inspections on the performance of BOT projects rely on the city councils and their departments which is not ideal. The Chinese NAO and its branches at provincial and city level have been able to take on this responsibility because they are already responsible for audits and evaluate all publicly funded projects at all levels of government. The roles, experiences, capabilities and skills of the Chinese NAO are able to properly conduct such evaluations on BOT projects.

7.3.5 Improving the Planning of BOTs in the motorway and water sectors: relevant experience and lessons from the British PFIs

This study reveals that city and provincial councils in China made decisions on BOT planning, in terms of short-term targets and political pressure. Without improving the incentives of using BOTs, it is difficult to alter BOT's decision-making, long-term planning and project design practice. However, it is difficult to change the short-term oriented incentives of local governments and PFIs offer no answer to this problem. Some PFI projects are also driven by short-term targets, e.g. the off-balance finance driven PFI projects (NAO, 2009).

Whole-life costing and value for money are important lynchpins in PFI planning and decision-making (Treasury, 2003), but their implementation in PFI has been very controversial. The whole-life costing method is very relevant to BOT practice in China and will force the governments and contractors to carefully think about the whole-life cost and performance of infrastructure rather than making short-term decisions based on short-term budgets (The Treasury Committee, 2011). However, this method was rarely used in publicly funded projects and in the early BOT planning. For city councils in China, it may

be difficult to conduct a whole-life costing analysis because of the lack of financial expertise and the absence of strong commercial skills and experience. Only a few provinces have the potential to use whole-life costing in managing BOT projects.

Therefore, in order to make good decisions and to plan well, city councils need to put the emphasis on improving the current planning practice, e.g. improving the quality of 'economic appraisals and analysis' on BOTs. City councils and their decision-makers need to seriously understand the importance of financial feasibility analysis, cost-benefit analysis, environmental impact analysis and fiscal affordability tests. The fiscal affordability test is not compulsory for BOT projects. Also, the provincial Development and Reform Commission and BOT line departments, e.g. the Transportation and the Construction Departments, need to effectively audit and inspect the city councils' decision-making, planning and design in BOT transactions.

The British PFI's show the importance of good planning in the whole procedure of PFI practice. In fact, by looking into the processes of implementing PFIs, preparation and planning works are the highest priority of the central and local procuring authorities (although in practice, some PFIs also failed to carry out good planning and preparation works). To achieve high quality planning and secure the quality of PFI transactions, the procuring authorities need to follow some important steps to assess their strategies, appraisals and business cases defined in the technical guidance and assessment documents, e.g. the Green Book and Value-for-Money assessments published by the Treasury, and the Gateway Review 1-4 which was issued by the OGC. The PFI approval authority in the Treasury also established a clear criteria for PFI applications (Treasury, 2009), including: a) affordability, b) design quality, c) output specification, d) risk allocation, e) commercial interest, f) compliance with a standard form, g) value for money analysis, h) suitability of advisors, i) indicative timetable, j) capability and competence of project team, k) commitment of sponsors, stakeholders, and users.

Some of these experiences and lessons of PFIs are important and relevant to achieve good quality project planning in BOT projects, e.g. consideration of financial affordability of local governments, importance of output specification as well as risk allocation, suitability of advisors and capability and competence of project teams. Some points have been

discussed in other sections of this chapter but two points need to be considered here. Firstly, BOT is an 'outputs' and 'performance' based approach. Therefore identifying the outputs of BOT contracts is crucial to the use of the BOT model. However, most of the city councils in China do not have the capabilities and know-how to define BOT's output specifications, including the service's quality, costs and availability. During the course of the interviews, frontline managers noted problems in relation to clearly defining the outputs of their BOT contracts, but they had no idea how to resolve it. Training for local BOT contractor managers should be given regarding this emerging issue.

Risk management is another weakness of BOT and PFI planning. The PFI's lessons indicated that identification, valuation and allocation of risks are important elements of PFI planning and that they should be written into the contracts. However, the emerging issues from this surround what risks have been substantially transferred to private contractors and to what extent. The negative lessons from PFI highlighted that there may be only a few risks transferred to private contractors who could then charge high premiums for taking on these risks. Edwards et. al. (2004), Coulson (2006) and the Economic Affairs Committee (2009) explored that only some construction risks, e.g. cost overrun risks and project delay risks, were transferred to private contractors. Furthermore, some risks were transferred back to the public sector in some PFI cases. Edwards et. al. (2004) revealed that in PFI road projects, the demand risks on road services were essentially afforded by public bodies and not private contractors. To improve the planning works of BOT projects, three lessons from PFIs are quite important. Firstly, the Chinese city councils need to study and identify the risks associated with a BOT project as early as possible in the planning stage. Secondly, not all of the risks can be transferred to private contractors. Transferring too many risks would lead to high premiums charged by contractors. This is because as private contractors take on more risks, they ask for more returns, which would increase the costs of the contract. Also misallocation of project risks between the governments and contractors would finally contribute to lower value for money and the projects' collapse and cancellation, due to BOT contractors unable to manage the risks in terms of their own capabilities. Finally, the city governments need to carefully study what risks could be transferred to private

contractors and at what prices. A realistic way to look at the risk transfer issue is for the Chinese government to at least build a risk assessment protocol.

7.3.6 Improving the procurement and tendering processes of BOT: qualified bidders, tendering methods, transaction costs and degree of competition

This study also discovered that competition in water BOT tendering is weak, because nearly half of all water BOTs adopted one-to-one non-competitive bidding. The results of this research show that local governments would benefit from stronger competition in the tendering processes. Based upon the findings of this study, as well as the lessons from the British PFIs (NAO, 2003, 2007, 2009, PAC, 2003), the degree of competition in BOT tendering depends on many factors, but the important ones are the rate of returns and size of the projects, complexity and the costs of bidding. The projects with the high rates of return normally attract more bidders, therefore competition is stronger. However, it is very difficult for small-size water BOTs to attract qualified BOT bidders because of the lower rate of return and relatively high bidding costs. Even in some water supply and sewage treatment BOTs, competitive bidding cannot be applied, and negotiation has to be adopted. This study suggested that city councils or public agencies could invite two or more bidders to negotiate at the same time. This would increase the degree of competition between different bidders, although it would also increase the costs of the BOT bidding.

One of the biggest issues for the procurement and bidding of Chinese BOTs is when the city government does not select and appoint qualified bidders, leading to the collapse of a project. In 35 cases of water and motorway BOTs involved in this study, inexperienced and low-quality bidders were chosen by the city councils and local procuring bodies, causing a number of problems in the construction and operation stages. These problems included poor quality construction and poor operation of water facilities. In the cases of British PFIs, the criteria of selecting and appointing a preferred bidder was designed by the governments and advocated by the World Bank, which directly cited this guidance on its website (see, Treasury, 2004, Guidance on How to select and appoint a preferred bidder). The preferred bidders must have:

- *presented proposals that meet the output specification;*

- *provided whole life value for money;*
- *accepted the key contractual terms and the required transfer of risk;*
- *confirmed access to finance that does not require underwriting by the public sector or revisions to the contractual terms;*
- *quoted a unitary charge and specified other costs, if there are any, that are affordable to the public sector;*
- *if a consortium is involved, demonstrated fully that it is a cohesive entity rather than a disparate collection of constructors and service providers.*

Based upon the findings of this research, not all these criteria of PFI could be used in the practice of BOTs in China. This is because of the availability of qualified BOT contractors in the market as well as the emphasis of the governments on the selection of preferred bidders. With an underdeveloped private economy, the priorities of Chinese city councils are on how to attract high-quality contractors to get involved in BOT bidding. Also, informed by PFI experiences, Chinese local governments need to consider the bidder's overall capabilities rather than focus on the lowest bidding prices. As the findings of this study highlights bidder's financing capabilities and experience on managing public infrastructure projects needs to be carefully checked by the public procuring bodies. Similarly, in selecting and appointing external advisors, local authorities also need to consider the experiences and skills of BOT consulting firms rather than the prices they offer. In fact, these practical and emerging issues in BOT procurement and tendering are relevant to several factors, e.g. good project selection, high rate of return and lower risks of BOT projects, availability of high quality contractors in the market and competition amongst bidders.

7.3.7 Improving the evaluation and inspection of construction and operational procedures within BOT projects

The quality of the construction and operational procedures within BOT projects largely relies on inspection from the contract client. The lessons of PFI highlight that the absence of full-time project managers, having unskilled staff in the governments and a lack of penalties for contractor errors contribute to poor quality and services of PFI projects (NAO,

2009, Economic Affairs Committee, 2009). These problems were also observed in BOT practice in China; however the situation here was even worse than in the UK. By addressing these transferable lessons from the UK, Chinese city government project managers need to appoint even more qualified and full-time experts to supervise BOT construction and operation. Training should also be given to inexperienced project managers. In some cases, qualified project surveyors or accountants need to be introduced into the project, to identify the real quality, cost and relevant financial data of the construction and operation. A full data record system should be established by the city government to measure and backup the data surrounding contractor performance, and a construction quality standard needs to be established by the central government and its line ministries. This was shown up by the experience from the UK (The Treasury, 2003, NAO, 2003, 2009b). The Ministry of Construction required that the city councils report the results of the water online-testing system every three months in all water and sewage treatment projects, including BOTs. In this way, the local authorities have to highlight the measurements to water BOT contractors.

The negative lessons from the PFIs are that the governments and projects managers normally put few penalties on any poor performance by PFI contractors (NAO, 2009). As has been discussed in the previous section, BOT and PFI are both implemented on the basis of contractor's performance and projects' outputs. The end-users and the governments paid for the high quality services provided by contractors. Therefore, based on this experience, the local authorities in China should make deductions or penalties for any poor performance of a BOT contractor. This acts as a way to secure value-for-money of end-users of motorway and water schemes.

Furthermore, the ideas of 'benchmark and market testing' of the British PFIs (NAO, 2007, PUK, 2007) may be studied by the city governments in China to regulate and evaluate the performance of BOT contractors. This study discovered that local and provincial governments have a large amount of data on the performance of publicly-funded motorway and water projects. This data and its indicators could be used by local authorities to compare the technical and economic performance indicators of BOT contractors, for example, operating costs, profit level and water quality. A detailed benchmark and market

testing tool would save construction and operational costs and enhance the bargaining powers of local authorities.

7.3.8 Improving the institutional capabilities of city governments to manage BOT projects.

The findings of this suggest that governments at all levels in China lack sufficient experts, skills and experience, as well as market knowledge to implement BOT policy. Necessary resources from the public sector are important to enable success in the motorway and water BOT programme, namely skilled BOT experts within the public sector and the budget for carrying out the BOT projects. To improve the institutional capabilities of the provincial and city governments in the short term, the experience from the British PFIs is helpful. A way of improving the governments' capabilities on managing PFIs, had been to introduce a large number of PFI experts into the public sector to offer advice on implementation at policy level as well as on the detailed technical problems within individual PFI projects. However, a number of reports and studies argued that the public sector in the UK may rely too heavily on the short-term external advisors in PFI procurement and tendering, leading to the public sector essentially losing experts and skills in managing public projects (Economic Affairs Committee, 2009). Medium term, the governments also need to provide more training for their PFI project managers and directors in local governments. This is because external expertise from the private sector can only be introduced into PFI projects in the short term during the tendering and bidding stages. (NAO, 2009a, The Economic Affairs Committee, 2009). A better understanding on the nature of BOT contracts and contract management, as well as commercial knowledge would be helpful to managers and staff in the public sector to perform better in BOT dealings. The relevant training would improve the skills, know-how, experience and confidence of public sector managers.

Some negative experiences were also observed in PFI project management. Ruane (2002) the PAC (2008) and the Economic Affairs Committee (2009) argued that it is common for PFI managers and directors in the public sector to be less-experienced and low-skilled, in some cases without a PFI related background. In many PFI projects, a full-time project

manager was absent, leading to a number of projects not properly inspected and managed. Similar findings have also shown that BOT teams in Chinese governments are often poorly resourced and empowered at present. They consist of a large proportion of temporary unskilled staff, low political authority and commitment, as well as inadequate budgets to support BOT transactions. All these factors created a number of issues in BOT's planning, design, tendering, negotiation and evaluation stages. The most significant issue is that all members of the BOT teams in city governments worked on a part-time basis and were unpaid for any extra work done. Therefore, members of BOT teams would lack conscientiousness with regards to their work, since no benefits could be achieved through hard work.

7.3.9 Creating environments to enable the implementation of BOT policies: legislation and financing systems

The findings of this research indicated that there are some barriers to the use of the BOT programme which cannot be overcome without a strong political commitment from high levels of government, notably the problems related to the BOT legislative framework and the restricted access to Chinese capital markets. The legal framework and system in China is a fundamental barrier to the implementation of the BOT programme. The government, especially the State Council, National Development and Reform Commission as well as the Ministry of Construction need to continually make efforts to improve BOT legislation, although few lessons could be learnt from the UK on this point.

Another significant problem discussed in the last two chapters is that the Chinese banking and capital markets have very strict regulations on the debt financing of private BOT contractors. Poor debt-financing resulted in the financing costs of the Chinese BOT model becoming very high. The World Bank (2003) suggested that BOTs should promote the use of debt financing in their projects in the same way as the PFIs have done (90% of their financing is from debt finances). However, this is easy to say but difficult to do. In the current situation it is difficult for Chinese BOT contractors to get financial help from the Chinese state-owned banks or to raise money from corporate bond markets. This is because of the higher risks of BOT projects and poor credit of Chinese domestic BOT contractors

which bring higher risks to Chinese commercial banks. This issue is not relevant to the experience of PFI.

The governments in China need to find a realistic way to provide financing for private contractors and BOT projects. The experience of British PFIs indicates that some banks played a leading role in some BOT projects, such as Barclays and the HSBC's infrastructure finance department. In fact, the National Development Bank of China which specialises in developing infrastructure projects is considering the opportunities of offering loans to BOT contractors as this study has explored. Other commercial banks and insurance companies are also studying the possibilities of directly participating in BOT projects. A bank-led BOT model needs to be considered by the governments and the state-owned banks in China. However, a bank-led BOT model such as in the UK and Australia would require the focus of a different study that would concentrate on the banking industry's involvement in BOT.

7.3.10 Accounting issues relating to BOTs in China

This study has revealed one of the main drivers for the implementation of BOTs is that the government at provincial and city levels wished to benefit from extra extra-budgetary finance. This has a similarity to the implementation of the British PFIs (NAO, 2011, 2009a, The Treasury Committee, 2011). The accounting and budgetary incentives of BOT and PFI led to poor investment decisions. Some provincial and local governments tried to use BOTs as much as possible in their motorway and water projects. However, potential fiscal risks, affordability problems and relevant accounting treatment on the BOT approach have not been fully considered by central and local governments. According to an investigation by the World Bank, the value of Chinese BOT contracts in all sectors was at least £70 Billion in 2009, similar to PFI's in the UK. However, they were not presented in any financial and budgetary report to the government at city and provincial levels. The government in the UK had already presented some PFIs in their balance sheets in terms of the IFRS 12 by recognising the debates on the 'off-balance finance sheet' matters in relation to PFI projects and with the enforcement of the International Financial Reporting Standards by the British

authorities in 2008. Despite this, PFIs are still excluded from the National Accounts which adopt UK accounting standards.

By considering the accounting and budgeting system applied in China's government at present, it is not feasible to bring BOTs into the accounts and financial reports of the local authorities immediately. However, the central government of China should be aware of the potential fiscal risks brought by BOTs, which can become invisible debts of the local governments at city and provincial levels. The central government in China was already aware of the explicit debts and borrowing of the Chinese local governments. The initial investigation and statistics on provincial and city councils' debts (loans) were concluded in 2011. The CNAO's report indicated that the explicit debts of provincial, city and county governments is over £1 Trillion (RMB 10 trillion) at the end of 2010, accounting for 27% of the GDP. Therefore the BOT as an extra extra-budgetary financing method should be studied by the central government. Possible accounting solutions could be given in the future, such as the IFRS application used in Chinese Business Enterprises Accounting Standards. This recommends the Chinese governments need to investigate how extensive the scale of BOTs are and the potential financial risks to city governments.

7.4 Summary

Based upon the main findings of the study, this chapter highlights the key contributing factors which have a profound influence on the development and implementation of the Chinese BOT model in the motorway and water sectors. By considering the results of this research, a comparison of BOTs and PFIs indicated that there are some fundamental differences between Chinese BOT practice and British PFI's. Major differences were observed in areas of institutional context and related industries and also in the fields of government and private contractor capability, BOT governance institutions and management structures. These differences largely constrained China from learning lessons and good practice from the British PFIs. A systematic learning of the lessons from PFIs in the UK is not possible due to this reason. As discussed in the above sections, even a 'piecemeal' approach to learning these lessons is difficult for Chinese governments. In

many cases, China and the UK's governments faced similar problems in developing and implementing privately financed policies. However, poor capability and insufficient resources in the city governments of China resulted in solutions from the UK not being applicable for solving similar problems with BOTs. Only a few practical lessons and experiences of PFIs are relevant and applicable to China's provinces. This study found that some ideas of PFI management and governance are really valuable to China, such as public sector comparators, value-for-money tests, whole-life costing methods, benchmarking and market testing, risk transfer and allocation, plus the relational contracting approach. However, the practice of PFIs underpinned these ideas which are still controversial in the UK and not transferable to China. By addressing the findings of this study the main barriers preventing the learning of lessons in China include the following points, objectives and major priorities of using the BOT model,

- notably, the financial situation and the fiscal crisis of local governments,
- capacity and resources of local governments in managing the BOT model, e.g. necessary experts, experiences, commercial skills and knowledge and sufficient budgets,
- availability, capacity and resources of high quality BOT contractors in the market and their comprehensive capabilities, e.g. experience, skills, and managerial and financing capability to build, design, operate and finance large infrastructure projects,
- development of a framework of legislation for BOT,
- the development level of banking industries and capital markets and the support they give,
- development of BOT consulting industries,
- national strategies on developing infrastructure projects.

Constrained by these contextual factors, BOT practice cannot be changed and improved overnight. This study has highlighted that the improvements on the current BOT practice in China will be a long-term and gradual process. Meanwhile, local governments at provincial and city level need to put emphasis on improvements to their own current BOT projects, and especially improvements addressing the local context. There is no unified solution.

In fact, this chapter follows the framework of Rose's Lessons-Learning (1992, 2005). It explores the problems and causes of applying BOTs in China and considers possible lessons and solutions from the UK. Some relevant PFI lessons have been identified, but other experiences and lessons from the UK are not highly relevant to China and its local governments in 34 provinces. As Rose's model (2005) indicates, to decide if a lesson could be learnt from another country, the policy importing country needs to address context influences in its own country, as well as whether they have sufficient resources (e.g. necessary institutions, budgetary finance, experts and skills in the governments) to apply possible solutions. As discussed in this chapter, some significant weaknesses of using privately financed projects were observed in the UK and China. These included high costs of using long-term BOT and PFI contracts (e.g. high financing costs, high premiums on risk transfer, difficulties on identifying and allocating risks associated with projects, inflexibility of contracts), and the short-term oriented accounting and budgetary incentives of using BOT and PFI. These two fundamental problems caused a number of faults and emerging issues in the infrastructure projects' planning, procurement, tendering and post contract management. Higher costs may not sufficiently offset the benefits of using BOT and PFI. Short-term oriented objectives and the accounting and budgetary incentives of BOT and PFI often lead to them being used even if they do not provide value-for-money. However, there are still no obvious solutions in the UK and China. Therefore, what should China do?

The next chapter will offer nine strategic rules to improve the governance of BOTs in China in future, draws on the 'transaction costs economics'. And, the chapter 9 will draw a conclusion and make some detailed recommendations on the future development and implementation of BOTs in China's motorway and water sectors, based upon the relevant lessons gained from the UK's PFIs.

Chapter 8 Managing Build-Operate-Transfer Projects in China: The Strategic Rules for Governments

8.1 Introduction

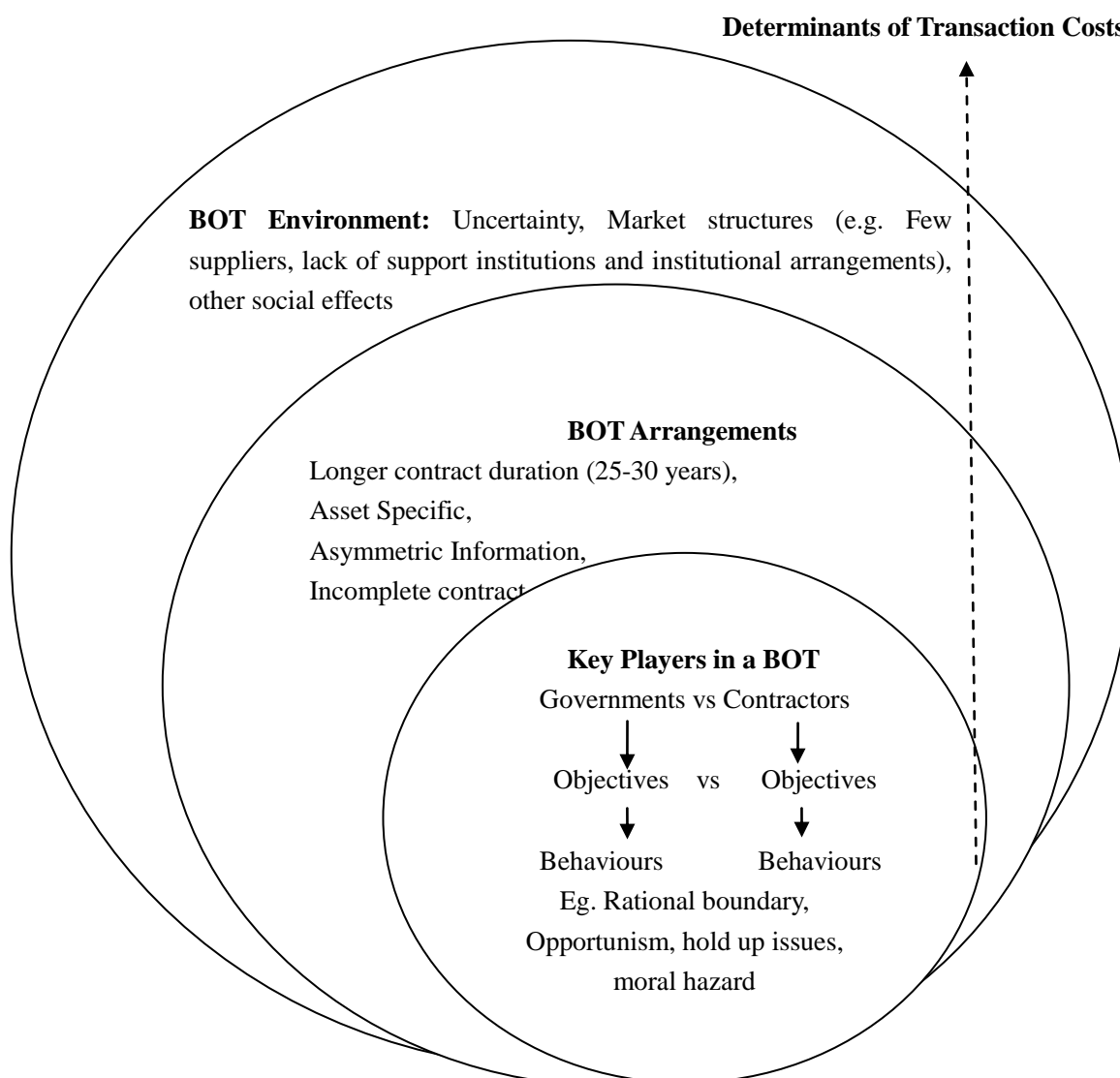
The last chapter discussed the key findings of this study, including the key failures and successes of implementing BOTs in China's motorway and water sectors, and the common lessons of applying Chinese BOTs and the UK's PFIs at present. These lessons showed that both of the governments in China and in the UK are suffering a series of problems surrounding BOT or PFI projects and their contractual management. The core matter, in relation to the applications of BOTs and PFIs, is the transaction costs. By addressing these issues surrounding the BOT practice, the basic questions for Chinese local authorities to re-consider are firstly, why do the national and local governments actively promote the use of private financing models in infrastructure projects? Secondly, when will governments use private finance participation models to develop infrastructure projects? In other words, which delivery model would make the most sense and in what situation? Thirdly, how will governments implement and manage the BOTs and what outcomes do they hope to achieve?

This chapter offers the strategic rules for Chinese local authorities by considering the lessons learnt from the management and implementation of BOTs and PFIs in the past. All of these strategic rules are generated from the experiences of adopting British PFIs and Chinese BOTs, and draw upon a transaction cost economic analysis. Following this chapter, detailed suggestions will be made in chapter 9.

A transaction cost theoretical framework is employed here, for the following reasons. Firstly, the findings of this study show that governments of both the UK and China met common challenges on managing privately financed, long-term contracting models to delivery public infrastructure projects and services, even though the social, economic and political contexts are divergent in these two countries. For better governance on BOT projects, the key improvement should be to pay attention on how to properly manage the BOT projects and their contractual practices, by addressing relevant similar

lessons from the UK (e.g. Cambridge Economic Policy Associates, 2000, Dixon, et.al., 2005, Pollitt, 2005, NAO, 2011). Transaction cost theory will inform of the possible solutions and strategies for the governments for managing their BOT projects.

Diagram 8.1 Determinants of Transaction costs in BOT and PFI cases: human factors, nature of long-term contract and environmental variables



Secondly, the TCE framework is able to link different factors and variables that have strong effects on the implementation of BOTs, see diagram 8.1. A BOT or a PFI project is sophisticated, it is a cross-disciplinary work that involves a number of managerial areas, e.g. financial management, policy management, project management, contract management, legal arrangements etc. The transaction cost theory can link these different

areas together and offer an integrated analytical framework with the key link between them being the transaction cost. By understanding and exploring how transaction costs of BOT projects are determined and changed in different stages of the project, it is possible to develop the strategic rules for government to minimize or mitigate these costs and finally to improve BOT implementation and the decision-making policy (see diagram 8.1 on the last page). By using the concept of 'transaction costs', this study can throw light on the following: the relationship and interactions between the 'outcomes' of using the BOT model; the human factors and motivations of key players of BOTs, the BOT management mechanism (e.g. the issues associated with BOT decision-making, planning, contracting and evaluation); the BOT's institutional arrangements (the problems in relation to the BOT governance structure) and the social-economic contexts of BOT operation (e.g. 'uncertainty' in the market).

Furthermore, from the aspect of transaction cost theory, as Vinning and Boardman (2008) debated, the sum of the *total costs* to provide the infrastructure should include the direct production costs (e.g. the construction costs, operating costs etc.), and also the transaction costs and the various external costs, whilst maintaining acceptable quality conditions. Vinning and Boardman (2008: 150) introduced a new concept in their paper, the '*total social costs*' (of a privately financed project), which include: the production costs of BOTs; their transaction costs; (net) negative external costs; and finally holding quality standards. When governments judge the way to deliver infrastructure, they should seek the option that will be able to minimise the sum of the total social costs. Failures and ignorance on transaction costs and social externalities associated with privately financed projects (PFI or BOT) would result in making wrong decisions and lead to project failures. The use of value-for-money test is a typical example of this. For instance, Coulson(2006) argued that the value-for-money test (PSCs) clearly ignores not only the transaction costs of PFIs, but also other negative social externalities, leading to poor decisions being made and negative external activity (e.g. strong opposition from the Unions). In many BOT cases the Chinese local authorities made similar mistakes.

They often ignored the transaction costs of BOT deals and were less concerned with the negative social costs brought on by BOT projects (particularly in planning processes). Examples include the unpopular acquisition of a farmer's land with unfair compensation, and also the hiring of unemployed staff from the SOEs upon the adoption of BOTs. In these cases, the 'production and operational costs' of BOTs seem very low. However, the total social costs were higher than other routes providing public infrastructure, since some transaction and social costs were transferred at later stages of the projects, or created negative externalities to the local communities.

Meanwhile, human factors and variables need to be taken into account during analysis of the implementation of BOT and PFI projects. These include the divergent goals and motivations of the participants (conflicts of interest between governments and private contractors), and the opportunism in the contracting practice. The starting point of a transaction cost analysis on the BOT and PFI model should be the real motivation and goal of governments and private contractors. The evidence from China and the UK revealed that private sector participants aimed to maximise their profits, and public authorities mainly wished to achieve short-term budgetary and political goals. These divergent goals (interests and goals conflicts) in a BOT or a PFI would contribute a number of difficulties, conflicts and opportunistic behaviours into the processes of performing and managing BOT contracts. They would inevitably increase the transaction costs, reduce projects' quality, create negative externalities, and a dissolute partnership at the end (Vinning and Boardman, 2008, Yescombe, 2007, Flynn, 2007). Human resources within governments are another consideration. The questions for governments are whether there are sufficient BOT experts and professionals in the public sector, or if the project managers and decision-makers have sufficient knowledge and skills to manage BOTs in practice.

Finally, for achieving a good analysis on the total costs of BOTs and PFIs, and making the right decisions on adopting a privately financed model, the nature of the contract, project and market also need to be carefully considered by the governments. The

findings of this research have already indicated that the total costs of using a privately financed model can be extremely high, especially when the projects have high asset specificity, high complexity and many unforeseen events (uncertainty), with low competitiveness (since there are few suppliers available in the market), and with insufficient support from under-developed (Chinese) banking, consulting and legal systems. All projects involved in this study, such as highways and water facilities have the characteristics mentioned above. Thus, transaction costs of BOTs in Chinese contexts and circumstances are likely to be higher than those of a publicly funded and managed alternative and also maybe higher than PFIs in the UK, due to China's insufficient experience of managing a market-oriented economic system. Higher transaction costs and higher total social costs of Chinese BOT projects also suggest that the risks and possibilities of failure of the projects are likewise higher than traditional government provision and that of other countries.

By recalling the key elements of TCEs, combined with the evidence from the BOTs and PFIs, we find that the detailed problems associated with BOT projects may occur in different stages throughout the project life cycle (as discussed in chapter 7). However, the main factor surrounding Chinese BOT and the UK's PFI is the 'transaction cost'. A series of implementation and operational matters associated with BOT deals can be traced and conceptualised to their fundamental causes, potential transaction costs and social costs involved in the projects. Through analysing and identifying how these costs are changed and raised (discussed in chapter 6 and 7), it is possible for Chinese governments to learn some of these strategic rules and to minimize these costs and improve the future governance of BOTs.

8.2 Strategic rule 1: Thinking and planning strategically

As Vinning and Boardman (2008), Coulson (2006), Lonsdale (2005) and Greeve (2008) argued (as well as the findings of this study), when the governments considered using the BOT (PPP) model, their main concerns were normally the 'production costs', not

transaction costs and external costs. Therefore, it suggests that for a better management of BOTs in China, the governments should seek to strategically calculate and minimise the sum *total social costs* of using BOTs at the present value. This would include not only the construction costs and payments to BOT contractors, but also the contractual transaction costs, (net) negative externalities, and finally maintaining a constant quality. In this way, the decision-makers in governments are able to think about the applications of BOTs more comprehensively (rather than focusing on economic aspects in the short-term), then making relevant decisions in the right way. The governments who are going to adopt BOT models need to strategically evaluate and trade off the potential social and economic benefits and costs of the BOT financing model and not just focus on the administrative, economic and financial fields.

Meanwhile, a BOT project is a long-term project which covers a period of 20-30 years. Although every local authority in China is facing major financial and administrative pressures at present, any short-term oriented decisions need to be in line with the long-term strategies and development of society. Otherwise, BOTs would fall into failure quickly. Many local authorities in China decided to adopt the BOT model just because BOT is able to postpone their financial crisis and delay political pressure on them at present. However, the authorities need to understand that the BOT model does not solve their crisis, as these issues will resurface two or three years later. It cannot be denied that the short-term impacts of BOTs are quite attractive for local authorities, e.g. mobilising a large amount of private capital, speeding up the local infrastructure development, reducing present financial pressures and creating more job and commercial opportunities for the local market. Also, BOT can bring economic benefits and positive social benefits to local communities in a short-term period in some cases, for example, significant improvements on local road systems, and environmental improvements on local water quality. However, the governments and their decision-makers need to think strategically about their BOT plans, by taking account of the long-term costs and benefits of projects, through an analysis of the social cost and

benefits throughout the projects' whole life cycle.

Since the Financial Crisis in 2008, a number of local governments in China have stopped and bought out their BOT contracts from the private partners. And more local councils in China abandoned their BOT proposals, turned to the traditional publicly financing models or debts finances, since the financial situations of Chinese local councils were largely improved following the issue of Chinese Stimulation Package in 2008. However, the cancellation of BOT contract were not free of costs, a large amount of compensations have been made to BOT contractors. This requires the governments to answer some questions: why did they abandon BOT model? And why did they choose BOT model at the beginning? The use of BOT model is just for 'getting money' from the private investors in many cases.

8.3 Strategic rule 2: Enhancing the understanding of the objectives of private contractors, managing interests and conflicts between governments and private participants in BOTs

Drawing upon the UK literature into the PFIs (e.g. Yescombe, 2007, Vinning and Boardman, 2008) and evidence from the Chinese BOTs, it can be found that the public and private participants clearly have conflicting goals within the BOT framework. Although a number of governments and officials claimed that BOT is a 'cooperation' and a 'win-win' game, conflicts between governments and private contractors have been observed in many cases.

These conflicts inevitably have influences on BOT management, increasing the transaction costs (possibly leading to negative social costs) and raising the possibility of opportunistic behaviour. Partnerships can eventually end up dissolved. This is because the private contractors normally want to maximise their long-term returns on the BOT projects at the present value. Private participants in BOTs would not voluntarily

consider social objectives or improve the efficiency of public services. Private contractors also would not naturally allocate risks with governments in BOT projects until there are considerable returns clearly defined in the contracts. Since private contractors are only wishing to achieve the maximum profits with minimum risks, they would make any attempts to defend their own interests throughout the project's life. However, the governments and their leaders are also 'self-interested'. Governments are mainly driven by accounting and budgetary incentives and political pressures. They need to solve their financial and budgeting matters, perform their superiors' administrative orders, and fulfil demands on local infrastructure and public services to achieve a good 'reputation' within their terms of office in the local community (chapter 5). The objectives and motivations of Chinese local authorities are more political and short-term orientated. The evidence from China shows the decision-makers in local authorities tended to solve their political and financial issues in a short period, but attempted to transfer all risks to private contractors with minimum costs. A high failure rate of BOT projects verified this way does not work in practice. The conflict of interests and goals between governments and private contractors is one of the basic reasons for conflicts and high transaction costs within the BOT model in China.

For the governments and their decision-makers, it is important to understand the fundamental objectives of private partners in BOTs. They can then give instructions to direct private contractors to gain reasonable returns and also bring net social benefits to local communities. The governments also need to pay more attention to the long-term benefits and costs brought in by BOT models rather than the short-term ones. The use of BOTs also requires the governments to make substantial contributions to the projects. The key point here is how effectively they define and allocate the risks and returns of the BOT projects. This requires a more complete and clearer BOT contract to define the responsibilities, benefits and risks allocation of governments and private participants. 'Partnership' is built upon a proper allocation of responsibilities and returns.

8.4 Strategic rule 3: Developing an 'open' and 'transparent' BOT project

This is another basic rule for all BOTs in China and the following two strategic rules need to be addressed from the use of PFIs and BOTs (Chesson and Maitland-Smith, 2006, Froud, 2003, Heald, 1997a, Dawson, 2001). Firstly, a privately financing model like BOT, should be presented and disclosed on the scheduled budgets or extra-budgets of governments and secondly, the relevant data and documents of BOTs should be deposited and open to the public. This should include the contracts of BOTs, or the key clauses that are important to the interests of the public. By considering the 'commercial confidentiality' of BOT transactions, the government as the agency of local communities should increase the real transparency of BOT transactions as much as possible.

There are three reasons for this basic strategic rule, especially for local governments at city and county levels in China. Firstly, the transparency of BOTs from an accounting point of view requires that the governments bring their BOT transactions back onto their scheduled financial reports, rather than treating these as extra-extra budget financing methods. Therefore, the potential influences of BOTs on the local public financial system as the public debts would be clearer. And this is a commitment for future governments and the local community. The current Chinese public sector accounting arrangements do not address BOT transactions and BOTs as a creative accounting means would put local public finance at large risk in future. Secondly, more transparency in BOTs procurement, bidding and contracting processes would lead to less risk of corruption and reduce the opportunistic behaviours of both the governments and private contractors to some degree. Finally, the public 'status' of BOT projects requires that the local governments clearly show how the public money (or service charges) is spent and evaluate the private contractors' performance (efficiency concerns). The local communities and people have the 'right to know' with regard to the information and efficiencies of 'public' infrastructure undertaken by 'private' contractors.

8.5 strategic rule 4: Establishing a clear BOT management framework

From a traditional management perspective, a BOT project includes some basic steps or activities and the government and local authorities need to carefully plan, organise, lead and evaluate (control) the projects. In this way, PFIs and BOTs both involve some key steps: 1) analysis of the necessity and desirability of projects, such as a social cost-benefits analysis, 2) comparison and balancing the decisions on different options of developing public infrastructure projects and public services (government production, BOT or contracting out), 3) organisation of the tendering, bidding and contracting of BOT processes and monitoring of the implementation process of BOT projects, and finally 4) overall evaluation of the projects and if BOTs have borne out government and public objectives.

However, as this study disclosed it is not clear which department should be responsible for what steps of work in a BOT project? It is confusing as to which agencies should be responsible for the planning, decision-making, organizing and evaluating processes. Too many departments of the local authorities were involved in BOT planning and decision-making, as this research explored. Also, there is no department to undertake the evaluating work in BOT projects. In many cases, the decision-makers and organisers of BOT projects evaluated the outcomes by themselves. This clearly gave them incentives and the public agencies and departments never criticized their own earlier decisions and works (Vinning and Boardman, 2008). The absence of a BOT evaluating system largely increased risks of performance of BOT contractors without any 'control' mechanism. There is also poor and inefficient communication and coordination between the planning, decision-making and implementing agencies within the public authorities. These agencies work separately for their own departments' interests, with little 'information exchange', leading to inefficient BOT project management and even raising strong conflicts between themselves. Therefore, there is a strong need that the governments to establish a clearer BOT management system and to adjust the current BOT administration institutions and framework. Furthermore, even if a clear

governance framework was built, it would also need sufficient BOT expertise in the public sector to manage the projects. The evidence from Chinese motorway and water projects revealed that the lack of BOT expertise, knowledge and skills are common problems for the decision-makers and project managers in local authorities.

8.6 Strategic rule 5: Maintaining reasonable competition in BOT bidding

As this study's findings show nearly all of the 30 small water and sewage BOTs adopted one-to-one negotiations in the bidding processes. As mentioned in the previous chapter, there are some disadvantages with one-to-one negotiation: e.g. Government is likely to get an expensive contract, due to their poor negotiating and commercial skills; very low transparency within the negotiating process often leading to the risk of corruption; and low value for money because of poor competition. To select the best bidders and contractors for a BOT project and achieve better value-for-money, there are some aspects to making the BOT bidding process as competitive as possible (Vinning and Boardman, 2008, Treasury, 2003a). Firstly, strong competition can be achieved by allowing publicly-owned enterprises participation in BOT bidding processes, especially for the SOEs in water and transport industries and publicly-listed in stock markets. The experience from BOTs shows that the degree of competition within BOT bidding would be enhanced by SOEs joining in. The bidders from the private sector would feel competitive pressure from the publicly-owned companies who have both strong financial and technical capabilities. Secondly, to achieve higher competitive levels, the governments need to find at least three bidders. However, for some small water projects in China, it is relatively difficult, since these projects were too small to achieve 'economic scale effects' and less attractive for the large companies. In this situation, the local authorities need to search the publicly owned companies could take on the projects. If few companies express their interests in the projects, two-to-one negotiation should be adopted in order to maintain the least competition. Finally, it is clear that competitive bidding may bring extra-costs for BOT projects and governments. However, as the

transaction costs show these costs inevitably occur during the BOT contracting process, and can only be remunerated later to the bidders. Or small contracts are simply too small to be likely to generate sufficient savings and a 'base' be placed below which BOT should not be considered.

8.7 Strategic rule 6: BOT model is not suitable for all kinds of projects: characteristics of infrastructure projects and BOT's transaction costs

As summarised by the Treasury of the UK (2003), De Lemos et.al., (2003), Dixon (2003) and Pollitt (2005), the PFI model is not suitable for all projects, particularly for small projects and IT projects. There are also strong debates as to whether the PFI model is workable in health projects in the UK. The decision on the adoption of a private finance model (like PFI and BOT) largely depends on the characteristics of an individual project. The analysis of transaction cost economics (Vinning and Boardman, 2008, Flynn, 2007) suggest that the projects which exhibit high asset-specificity, complexity and uncertainty normally have high transaction costs and high risks of failure, especially for the local authorities who lack strong commercial and contracting skills. Based upon the lessons from China's BOTs, small water projects would significantly minimise efficiency and increase the unit costs, leading to higher operating costs. High asset-specific projects with long-term uncertainty (motorway and water BOTs) also lead to opportunistic behaviours on each side of the BOT contracts. Both the governments and contractors have the risks of projects being held up. However, in China, the private contractors are often vulnerable due to their poor bargaining power with the governments in BOT transactions.

Although governments are able to mitigate some of these transaction costs through standardizing BOT contract models and training the public sector staff, local authorities still need to be aware that BOT models are not workable for all kinds of infrastructure projects. BOT models bring some risks into infrastructure projects, particularly for projects with high asset-specificity, complexity and uncertainty.

8.8 Strategic rule 7: Increasing the involvement of Chinese state-owned banks and creating more financial channels for private investors in BOT projects

By investigating 98 BOT projects in China's water and motorway industries, it surprised the researcher that Chinese state-owned banks (state-controlled commercial banks) are playing a very limited role at present, except for projects undertaken by Chinese state-owned enterprises and international investors. The government-owned banks in China have set a series of strict conditions for loan applications associated with BOT projects since they are highly 'risk averse'. To get a loan from China's state-owned banks, private investors would need to meet complex procedures and very strict conditions on credit audits. These directly increase the costs of BOT finance and create problems of BOT financing in practice. From the long-term aspect, without banks' supports, BOT projects are not able to be developed sustainably. The banks also lose the possibilities of gaining higher profits from participating in infrastructure projects. Although, the governments in China at all levels declared that they are going to encourage and support the development of a private economy, few realistic attempts have been made, e.g. financial support from the state-owned banks. This study believes the Chinese state-owned banks and local governments-controlled financial banks are able to play a more important role in BOT projects, in order to providing financial support to BOT contractors, and reducing the financing costs of BOT transactions.

However, this leads to the question as to why the local authorities or SOEs cannot directly access these loans to develop their infrastructure projects and, why the banks are not allowed to participate into the projects directly. This is another side to Chinese public sector management and the fiscal and management relationship between the central government and local governments (this has been discussed in chapter 2).

8.9 Strategic rule 8: Avoiding low debt-to-equity financing ratio, reducing financing costs and risks in BOTs

To ensure that the private sector participators in BOTs have sufficient equity for risks, and the governments can make sufficient incentives for them, local authorities in China normally require a very low debt-to-equity ratio in BOT contracts. In certain cases, the governments require private investors and contractors (or SPVs) of BOTs to put a considerable equity investment into the projects. The average equity finance (including all motorway and water projects) accounts for over 65% of total project investments. Within Chinese water BOTs, equity finance normally exceeds over 85% in total project value.

It is very common within BOT and PFI transactions for the parent companies to establish a separate, stand-alone company for a specific project (called project company in China or Special Purpose Vehicles in the UK). In this way the parent companies would minimize the amount of their own capital at risks and accept the limited liability defined by the contract. The governments' intention is that a large portion of equity finance in BOT investments would reduce the possibility of project companies and equity financiers declaring bankruptcy (experienced in the UK with the London Underground case, NAO, 2004a, NAO, 2004b, Flynn, 2007) and create strong incentives for BOT contractors, with equity financiers difficult to remove from the transaction. However, for BOT projects in China, the portion of equity finance in the total project investment is too high for private sponsors to maintain a stable cash flow, and significantly increases the financial costs of projects, leading to considerable financial costs and risks. Furthermore, the private contractors would require a higher return on BOTs, since the risks associated with projects are so high.

The lessons from the PFI and the BOT in China presented two extreme examples for implementing private participation in public infrastructure projects. A too high debt-to-equity ratio would reduce the incentives of private equity financiers to perform

the contract and actively solve the operational problems. The equity participants would declare bankruptcy to avoid their responsibilities and risks with the projects when things go wrong, e.g. The UK's PFI (Vinning and Boardman, 2008). However, a too low debt-to-equity ratio would significantly increase the financing costs and risks to private contractors who may not be able to handle them. Given that the contractors exiting procedures are not defined in BOT contracts, private participants can easily be locked-in which may finally lead to the collapse of the whole project. The governments in China need set a reasonable equity-to-total project investment ratio for a BOT project. In this way, a proper incentive for the private contractor can be created and the financial risks and costs of BOT projects would be reduced.

8.10 Strategic rule 9: Improving Chinese BOT's legal environments, establishing a transparent and low cost negotiation and arbitration system and identifying the private contractor exiting procedures in BOT contracts.

This study has shown that in one-third of the projects involved (23 projects), the governments and private contractors had strong conflicts. However, few of them renegotiated the contracts or put their disputes to the courts or arbitration agencies. The key reasons for this are the extremely high costs and extensive time taken up by renegotiations and lawsuits. Any major re-negotiations of a contract would be costly and time consuming, and needs the agreements of the leaders of the local authorities. In addition, the arbitration charge for BOT cases is as high as 3-5% of the contracting value of projects. From the transaction cost economics point of view, the legal costs surrounding BOTs are high which will discourage private participation in public infrastructure projects. Meanwhile, due to the suspicions of private contractors regarding the independence of the Chinese legal system, private investors would not put disputes with local governments into the courts. Therefore, improvements in the Chinese legal system need to be made, but more practically, a transparent and low-costs

arbitration system is needed to be able to bring some benefits for implementing BOTs. First of all, a low-cost arbitration system for BOTs would significantly reduce the transaction costs for both governments and private participators. Second, this system would improve the confidence of private investors in their BOT transactions. By protecting the interests and property right of private contractors, private participation in infrastructure would be indirectly promoted. Finally, based upon the BOT contracts agreements and other relevant laws, a transparent and fast arbitration procedure would force both parties of BOTs to perform their responsibilities and tasks seriously or they face immediate penalties (Vinning and Boardman, 2008).

However, when the disputes and re-negotiations between private participators and public authorities fail to reach an agreement and the BOT contract needs to be abrogated, there must be an exit system for the private contractor. The key point in this situation is who will take over the management of projects and what remedy or compensation arrangements will be made. In Chinese practice, the private sector contractors are often locked-in a BOT contract and unable to quit, with even the 'partnership' with government having disintegrated (this has been discussed in the chapter 6).

8.11 Summary

As chapters 7 and 8 have discussed, the implementation of BOT met a series of issues in China, particularly associated with 'transaction costs'. If the governments attempt to successfully use the BOT model to develop infrastructure and achieve expected outcomes, they need to minimise the total social costs associated with applications of BOTs, and follow the basic strategic rules, namely:

- Thinking and planning strategically by addressing the sum of total social costs of BOTs within their life cycle;
- Properly managing any conflict of interests with the private sector;
- Improving the transparency of information of BOT projects and contracts;
- Building a clear and efficient managerial and administrative framework;
- Maintaining a reasonable level of competition;

- Carefully selecting from the proposed projects by considering all aspects;
- Designing a proper financing structure with proper incentives for the private contractors;
- Arranging for substantial support by coordinating with state-owned banks as well as other BOT industries;
- Building a quick, low-cost re-negotiation and arbitration system and arranging an exiting procedure for private investors; and in the longer-run reforming the legal system, e.g. issuing the relevant BOT laws and regulations.

Each of these points aims to reduce the overall cost of adopting BOTs, so as to achieve value-for-money, and bring positive benefits to local communities and their residents. However, in practice, use of these strategic rules may increase some of the costs of BOT projects. The governments need to reform their current management structure and style together with making big adjustments on BOT related industries. It is possible that after considering and implementing these strategic rules, fewer BOTs would be adopted in the future. The BOT is a market-oriented route to developing infrastructure but is neither free of costs nor easy to manage, it should be more selectively used by governments. BOT is only applicable when the total social costs of the model are lower than government provision and can be traded off against the potential benefits. The divergent goals of both sides of the BOT contract; the nature of infrastructure projects; the contextual influences from the socio-economic environments and insufficient support from the BOT associated industries are all potential causes of conflict between governments and private participants. To improve the future management of BOTs, the governments need to address the strategic rules above in order to reduce costs of using the BOT model. These strategic rules need to be itemized into detailed instructions and recommendations.

It is time to review the applications of BOTs in China in the last three decades, in order to find out: the real benefits and costs of using the BOT model in China, the adaptability

of the BOT model in Chinese water and motorway sectors, what outcomes have been achieved so far, and how the governments will improve the implementation of BOT policy in future. This study indicates that the lessons of PFIs are relevant to China's BOTs, particularly for the managements on contractual practice. However, BOT as a market-oriented method may meet much more challenges in China, since the Chinese underdeveloped market economic system. In the next chapter, this study will draw a conclusion, and translate the strategic rules of managing BOTs into detailed instructions and recommendations at the end.

Chapter 9 Conclusions and Recommendations

9.1 Introduction

Based upon the findings and the discussions of the development and implementation of motorway and water BOTs in China, this study highlights the need for China's governments at both central and local levels to consider improvements to the use of BOT policy in the future. A number of city councils in China have reverted to public provision instead of the BOT models. In the cases of motorway and water BOTs in China, 30 out of 96 projects have been bought-out by the governments so far. Some local governments in China are continuing to push forward with plans for the private provision of key infrastructure services, while the large Fiscal Stimulus Package of the Chinese governments in 2008 and 2009 meant the use of BOT sharply decreased. In terms of the investigation of the World Bank (2011), only 15 BOT contracts were signed in 2010. In the present circumstances, the governments in China need to re-think the strategies and methods of using BOTs in developing public infrastructure in subsequent projects.

9.2 Conclusions

The central government in China has tried to encourage the governments at local level to develop infrastructure projects by adopting pro-market, pro-efficiency and pro-privatisation BOT policies. The leaders and senior officers of the country have been affected by the ideologies and practice of 'Public Choice' and New Public Management that have been implemented in public sector reforms of developed countries. Through the implementation of the BOT in China's motorway and water sector, the government claimed that BOT would:

- introduce private investment in the public infrastructure and utility industries,
- accelerate the development of the public infrastructure and services that had up to that time been suffering from under-investment,

- introduce competition in these markets, and improve the construction and operational efficiencies of public projects,
- improve resource allocation and investment decision-making in the public infrastructure and services, decreasing political intervention,
- and finally, to introduce new and advanced technologies, and technical innovations that were expected to be brought in by the private contractors.

However, this study found that many of the claimed benefits and objectives of the BOT have not been realised in practice, within the motorway and water sectors overall. BOTs made contributions to the promotion of efficiency, economy and effectiveness in some of the public infrastructure projects, but also failed to do so in a number of motorway and water cases.

This study has shown that the government in China has not established the relevant institutional capabilities and infrastructure to manage support and review the implementation of BOT projects. The existing BOT policy frameworks for motorway and water BOTs need greater clarity and standardization. The expected outcomes of using BOTs will only come when governments make a significant contribution and commitment towards good practice. The ‘arms length’ strategy of the government is not effective and sufficient to promote the development and implementation of BOT policy. Meanwhile, in terms of the findings of this study, the governments at provincial and city levels did not have sufficient capabilities, skills, experiences and knowledge to implement BOTs.

Secondly, BOT models have been implemented in practice with high transaction costs. The Chinese government should introduce a minimum contract to be used in their motorway and water projects, in terms of the size, value and specific features of the individual projects, and the local contexts. Ideally, future studies should be carried out in other sectors and provinces to see if the problems are replicated.

Thirdly, given the long-term duration and incompleteness of BOT contracts, opportunistic behaviour on both sides of the contractual agreement became a big barrier against forming long-term partnerships between the government and the private contractors. In nearly two-thirds of the 95 projects covered by this study, trust and good cooperation between the government and the contractors were not found.

Fourthly, the local government in China do not effectively control of the management and inspection of BOT contractors in a number of cases, as this study discovers. Even the public authorities did not assess the quality and service provided by the private contracts, due to the lack of a BOT regulation and evaluation system.

In addition, the real motivation for adopting BOTs by provincial and city governments are short-term and target-focused, The decision on implementing the BOT model was largely driven and influenced by the political and administrative interventions (centrally planned, industrial schemes) rather than an assessment of 'needs' of the local communities. The public, especially local residents and public service users were entirely excluded from the BOT projects' decisions-making and planning.

Private contractors aim to make 'profits' through providing public services and facilities. However, only a few 'strategic' BOT investors have both the experience and capability to develop and manage a large infrastructure projects. Most of these strategic investors are multi-national or Hong Kong based companies that are tending to acquire larger share in the water markets. The Chinese domestic BOT contractors are usually medium or small companies, and have neither the experience, nor the capability to manage an infrastructure project.

By analysing key enablers and barriers of implementing BOTs, this study highlights three sets of variables (contributory causes) which had profound influences on the outcomes and effectiveness of BOT projects. These included institutions in relation to BOTs, the weakness of the BOT model as a contracting method, including arrangements, policy and procedures of implementing the programme, and social, economic and political contexts. The findings of this study have shown there are some similarities existing between the Chinese BOT policy and British PFI programmes. However, significant differences between BOT and PFI were observed, expressing the difference between the British public sector's management and China's. Therefore whilst much of the policy context between British PFI and Chinese BOT are different some of the operational and emerging issues are the same. It is these relevant aspects that have generated the following recommendations. Only several lessons are transferable to a few provinces in China where a large number of BOTs and strong commercial and financial skills are available. This study indicates that if

BOT is used, just as a ‘financing’ tool. Then the failure rate is high and value-for-money is low. The implementation and development of BOT requires some fundamental public sector reforms and infrastructure adjustments in China.

By analysing key weaknesses of BOTs and addressing the relevant lesson from the British PFIs, this study then suggests how to making BOT policy workable in China and achieve potential benefits. The following actions may be adopted by the governments at different levels.

9.3 Cross-sector and strategic recommendations on the improvement of BOT policies

Recommendation A, in respect of the ‘right to know’ of the public as well as to increase the transparency of information of BOTs, a BOT database needs to be established by the central governments, e.g. National Reform and Development Commission, or China NAO, or by its line ministries, Ministry of Construction and Ministry of Transportation.

Recommendation B,

B-1 Decision makers and projects managers in Chinese governments need to clearly understand the relationship between transaction costs and overall costs and success of BOT. To use the BOT model, transaction costs are inevitably incurred. That is the cost of using a contracting approach.

B-2 A well-defined standardised BOT contract model will mitigate the transaction costs which need to be drafted by the central or provincial governments.

B-3 A standardised BOT contract may include different clauses. However, key components of the standardised contracts may clearly define the output specification, allocation of risks and well-defined performance-payments arrangements. The current version of China’s Standardised Water and Sewage Treatment BOT Contract models are not able to cope with these issues in practice. Thereby, they need to be continually updated by the Ministry of Construction.

B-4 Meanwhile, a standardised contract model may not address local contexts or situations and the characters of individual projects. Therefore, the BOT contract model should keep a certain flexibility in respect to the local contexts. The provincial and the city councils may revise the clauses of BOT contracts in terms of their own situation and projects’ features.

B-5 To decrease the opportunistic behaviours as well as information asymmetry in the contracting practice. The communication and a higher degree of transparency between the public clients and private contractors are important. Both governments and private contractors may exchange project information regularly.

B-6 Furthermore, regular inspections and audits on the performance of BOT contractors need to be conducted by the provincial and city councils, in order to ensure the governments or service-users get 'value-for-money'. The criteria of evaluation need to be defined in the contracts (this will be recommended in a later section).

B-7 Re-negotiations on BOT contract need to be considered and used by the governments to increase the flexibility of contracts. In many cases of China's BOT, re-negotiations seldom take place at present.

B-8 Finally, a rational contracting relationship needs to be established between the governments and contractors. Also, if the close relationship between the contractors and the project managers get too close it may increase opportunities for corruption and reduce competition.

B-9 The local governments at city level should establish their trustworthiness in the BOT market. In many cases used in this study, the power structure in the BOT contracts is not balanced. The local governments' bargaining power is much stronger than private contractors. Differing from PFIs in the UK, the private contractors were often 'hold-up' and 'locked-in' BOT contracts. The governments usually break the 'rules of the game' at first, resulting in big losses for private contractors. The negative result of government's opportunistic behaviours is clear and that the investors are scared away.

To implement these recommendations, a large amount of costs will occur for the public procuring bodies. However, at least these options are able to largely mitigate the costs and risks of long-term contracting. The governments need to estimate the benefits of BOTs and ensure they offset transaction and other costs of the use of BOTs.

Recommendation C, A clear framework for BOT legislation is important to attract private contractors and protect the interests of private investors. Provincial governments need to design and publish their own BOT circulars and regulations, therefore providing a framework for BOT legislation. This recommendation is not relevant to the UK's lessons.

However, it is still worth saying that at present, the biggest risks associated with Chinese BOTs are legal and political risks. This is because China is still in the process of a transition from the planning economy to market economy. The property rights, contracts, and independent courts have not fully developed. Practically, a transparent and low-costs arbitration system is needed to be able to bring some benefits for implementing BOTs. When the disputes and re-negotiations between private participators and public authorities fail to reach an agreement and the BOT contract needs to be abrogated, there must be an exit system for the private contractor.

Recommendation D, An effective BOT governance framework at provincial government and city levels is important to the development and implementation of BOT projects. In practice, there are a number of public bodies involved in a motorway (7 departments from the city council) and a water BOT transaction (7 or 9 departments). The current governance structure at city and provincial level is ineffective.

D-1 Therefore, the governments need to stream-line the existing responsibilities of the BOT governance framework.

D-2 A BOT unit needs to be introduced in some provinces where there are a large number of BOTs. As the experience of the British PFIs has shown, a central PPP unit plays an important role in the PFI's development, e.g. policy design, projects approval, provide assistance to local governments and issue technical guidance. However, the experience of the PFIs may be only transferable to a few provinces in China where the government actively proceeds with and manages a large number of BOTs.

D-3 The BOT unit need to be built into the Department of Development and Reform Commission or in the governor's office.

D-4 To establish a BOT unit at provincial level, the provincial governments need to carefully consider the potential costs and benefits in their own cases: the number of BOT projects in local areas, the availability of financial budgets for the unit, the availability of BOT experts in the local region, and the objectives and long-term strategies of the BOT model. The governments need to trade off the costs and benefits of creating a BOT unit.

D-5 Two major functions of the BOT unit at provincial level may include: 1) review and develop BOT provincial policies and guidance, 2) provide technical, legal and financial

assistance to the BOT practice at city council levels.

D-7 the governments at both central in line ministries and provincial governments need to design and publish detailed guidance in respect to the difficulties of BOT practice at city level.

D-8 BOT managerial authorities at provincial level also need to develop their own strategies, policies and guidance in order to improve adoptability of BOT at local level. Necessary technical support to city councils needs to be provided by provincial departments.

Recommendation E, In this study, one of largest differences between China's BOT and British PFI is the industrial contexts in the two countries. China has some disadvantages in implementing BOTs because of the under-developed financial, legal consulting sector and the entry restrictions on private contractors in state-owned banking and capital markets. This point is not relevant to PFI.

E-1 the government at central level and the state-owned commercial and policy banks need consider the possibilities of a deeper involvement in the BOT transaction.

E-2 A bank-led BOT model such as in the UK and Australia would require focus of a different study concentrate on banking industries involvement in BOT.

9.4 Recommendations on the developing motorway and water BOTs: improving BOT practice

In this section, the recommendations are made, in order to improve the practice of BOT at project level and at city level, by addressing relevant experience and lessons from the British PFIs. In terms of the findings of this study, due to increasing dissatisfaction with the BOT model, more and more public sector managers and decision-makers turned to identify the purpose of BOT, whether simply a financing need, or improvement of services. According to the findings and discussions in the last chapter, there is no definitive answer. This needs to be considered case by case, in terms of local authorities' fiscal situations and other social, economic and political contexts. As this study found the politicians, decision-makers and senior directors at city and provincial levels often do not look for the 'best solutions'. In some cases and situations, BOT is not an optimal option, but is satisfying

compromise choice for the local authorities. However, finally BOT was chosen. Decisions are normally made by what problems the councils faced and in what contexts. Decision-makers at city level may face different options in developing local infrastructure, while decisions were usually made in terms of short-term and politically-oriented considerations. This common issue is found in many BOT cases and cannot be changed in a short period. As this study has indicated the focus in local governments in China has been on the maximization of private investment, while Value-for-Money has normally been overlooked. Value-for-Money is not an objective (or emphasis) of the Chinese BOT model. This is a big difference between BOT and PFI. The lessons of Value-for-Money tests are not transferable and problematic, while some elements may be still relevant to some city councils where there are better financial situations, more financial expertise and rich commercial skills.

Recommendation F, for improving the planning quality of BOT,

F-1 Some elements and ideas of Value-for-Money Tests need be studied or pilot tested by some city councils, such as, ideas of Public-Sector Comparators by considering 'total social costs' of BOTs.

F-2 Whole-life costing method as an element of PFI planning also needs to be considered, such as evaluation on competing options, improved awareness of total costs, more accurate forecasting of cost profiles;

Above recommendations F1 and F2 are ONLY for the city councils who have rich experience with BOTs, have more financial experts and strong commercial skills to study. These methods and documents used in PFI investment planning and assessments only worked in the context of the UK. Even methods used in the PFI received a number of critiques.

F-3 Local councils may focus on the maximization the private investments in some circumstances. However, they also need to consider what potential risks BOTs brought in. A risk assessment protocol was needed at least.

F-4 Risks involved in the BOT projects should be well-defined and allocated. The public authorities need to understand that not all risks of BOTs are able to be transferred to private contractors. In practice, risk analysis of BOTs is not carefully conducted and costed, because the government attempts to transfer risks to the contractors as much as possible.

F-5 The councils at city level need to carefully select the projects best suited to use the BOT model, in terms of their rate of return, project value, size and the technical perspectives. Many water projects even failed in the project selection stage, due to the small size, high costs and low profitability. BOT model cannot be used in all public projects and solve all problems of governments.

F-6 The governments at local and provincial level need to understand the importance of financial feasibility analysis, costs-benefit analysis, and environmental impact analysis which are currently used in BOTs. These documents should not be made just for getting approvals and planning permissions. These documents are important analysis not simple justifications for use if BOT are adopted and should include more reliable information and analysis.

F-7 The provincial government also should offer guidance and training for local BOT managers on how to identify the 'output' and write an output specification of the projects. Even BOT projects were designed by the governments in many cases. The output specification still is an important part of the contract and a checklist of the contractor's performance

F-8 A standard approval procedure and criteria for undertaking a BOT project should be established at the provincial government level to provide guidelines. The current approval system at provincial level follows the procedures of publicly funded projects and does not address the features of BOTs.

Recommendation G, BOT as an extra extra-budgetary financing method (the description of some interviewees) should be studied by the central government and possible accounting solutions should be made in the future, such as IFRS application as applied to companies should be referred in government classification. This recommends the Chinese governments need to investigate how large the scale of BOTs are and the potential financial risks to city governments.

Recommendation H, The current BOT practice in the procurement and bidding processes has much room for further improvement. Some lessons from the UK are relevant here.

H-1 An open and competitive process should be the priority of the city councils, particularly for the projects with good profitability and low risks (some motorway BOTs).

H-2 Non-competitive biddings are adopted in a number of BOTs. The negotiation process should be more transparent, minimizing the corruption. Qualified advisors should be introduced on the public side to ensure good deals are made.

H-3 The selection of external advisors of BOT project should be based upon their experience, not the price they offer. To many city councils the advisory cost is too high. However, this is a cost of using the contracting method.

H-4 When identifying the preferred bidders for a BOT contract, the local governments should consider their comprehensive capabilities rather than focus on the lowest bidding prices. The bidder's background and experience on managing public infrastructure project should be considered.

Recommendation I, The performance and process of construction and operation should be properly supervised and inspected by the public authorities.

I-1 Due to the poor performance of construction and operation for BOTs revealed in this research, local authorities should conduct close evaluation and inspection on the motorway and water projects regularly in the construction and operational phases of the projects.

I-2 For the motorway projects, the inspection should focus on the quality of projects. For the water BOTs, the inspection needs more emphasis on the operation processes.

I-3 Finally, the ideas of 'benchmark and market testing' methods used in British PFIs should be adopted by the city governments in China to regulate the performance of BOT contractors at post-contracting stages.

I-4 The local branch of the Chinese National Audit Office needs to include and inspect the regulations of BOT.

Recommendation J, Finally this study highlighted that the results of BOTs were largely affected by the capabilities of the public sectors and their staffs.

J-1 The governments at provincial and city levels in China need more training for decision-makers and project managers in areas of commercial knowledge, skills and theories of implementing BOT programmes.

J-2 Provincial and central governments need to organise forums or a network to share knowledge and lessons of the implementation of BOTs.

J-3 Full-time and skilled BOT project managers need to be appointed to contract and supervise the performance of BOT projects.

J-4 The managers and experts of local councils who worked in the temporary BOT project teams need to be paid for additional responsibility.

J-5 More financial budgets need to be approved by the local councils who carry out the related works in BOT projects.

At the end of this section, by reviewing the findings of this research, the author recommended,

Recommendation K, Although motorway BOTs' performance has not been as good as the government anticipated, BOT models still bring a number of economic and social benefits for local communities. The BOT model can be used in the subsequent projects, by addressed the problems in previous cases.

Recommendation L, However, the overall result of the implementation of water BOTs is negative. The governments need to consider to continuously improve the model in the water sector. And remove the key barriers of using the BOT model in water industries.

9.5 The relevance between this study and previous research into China's motorway and water BOTs

This study explores and presents the problems surrounding the implementation of BOT in Chinese motorway and water sectors, enhancing the understanding on the contributing factors of successfully implementing BOTs. By drawing lessons from the British PFIs in the last decades, this thesis has made detailed recommendations on the possible improvement of the Chinese BOTs. Some findings and conclusions of this study differ from those of previous studies on China's motorway and water BOTs. Although there are over 50 reports, papers and books which have been conducted by international and Chinese scholars, and governments and organisations, significant differences between their findings and those

of this study have been found.

Firstly, the scale and scope of the implementation of motorway and water BOTs in China were largely under-estimated by the World Bank (2003), PPI (2010) and the Asian Development Bank (2005). According to the evidence gathered from China (as it has noted in chapter 5), over 400 recently established water and sewage treatment plants have adopted BOT models since 2002. Nearly 20% of total motorway investments in China were funded by BOT approaches since 2001.

Secondly, the shortfalls of BOT as a long term contracting approach to develop local infrastructure projects were overlooked by previous studies. Matters related to transaction costs, incompleteness and inflexibilities of long term contracts and opportunist behaviours were rarely studied and discussed by the literature of the Chinese BOTs. This study recommends that the water and small size projects may not be suitable for the use of the BOT model. However, large scale motorway projects had fewer problems during the implementation of BOTs.

Thirdly, most of the previous studies focused on the short-term financial benefits of BOTs since the programmes were introduced to urgently boost capital investment for China's public infrastructures (Blackman and Wu, 1998, Fu, Chang and Zhong , 2006, Wang & Ke, 2008, Adams et al, 2006, Qin and Yu, 2005, Cheng & Wang, 2009). However, the long-term effects and accounting matters of implementing BOT, such as the financial affordability and the long term debts of local governments have not been fully studied.

Fourthly, although a number of Chinese scholars (for instances, Fu, Chang and Zhong, 2006, and Wang and Ke, 2008) found that, in the post-contracting stage of water and power plant BOT projects, the degree of competition was not sufficient. At the same time, Ho (2006), Adams et. al. (2006) and Qin and Yu (2005) debated that the Chinese provincial and city governments emphasis was on attracting BOT investment from the private sector, and paying little attention to creating market competition and efficiency improvements. However, these studies were not aware of the real 'incentives' of adopting BOTs from the local authorities in China who were driven by short-term political or administrative orders and targets. Also, the local governments did not recognise ways and means to strengthen competitions and improve efficiency. Zhong et al, (2008), Fu, Chang and Zhong (2006),

Chen & Messor (2003), expressed similar opinions about the goals of Chinese BOTs, while contesting that the efficiency promotion in Chinese BOTs cannot be easily achieved in practice without considering institutions, conditions and contextual constraints of the BOTs applied. This study further suggested that it is difficult and complex task to strengthen the competitions and improve the efficiency of BOT project. The local authorities needed to address some key factors in relation to the competition and efficiency of BOT projects, such as the characters of motorway and water industries, the transaction costs of the projects and the management and supervision on BOTs after the contract let out.

Fifthly, similar to this study, a number of scholars and organisations argued (The World Bank, 2003, ADB, 2005, Adams, et. al. 2006, Zhong, 2008, Fu, et. al, 2006), that in contrast to the growing number of BOT projects in China, the BOT policy and the regulatory, and legal frameworks had developed slowly in the last two decades. This study has discovered that the current frameworks of BOTs are still under-developed and incomplete, similar to 5 years ago. There have been a handful of BOT policies that have been published by the central government and its ministries since 2006. All of these official BOT policies were still too simple and too vague to be used. Furthermore, the existing institutions at local and central governments were insufficient and incapable of implementing BOT in China.

Sixthly, over half of the studies on Chinese BOTs were about risks allocation and management, and almost all these 25 studies were based upon quantitative surveys. They also only represented the perceptions of BOT project managers (Wang, S.Q., et. al., 1999, Wang, S.Q., et. al., 2000, Zeng, et. al., 2008, Chen, Xuan and An, 2010). Although the political and some commercial risks have been identified by those research, the risks which brought in by incomplete BOT contracts were not considered, e.g. the risks and effects of 'hold-up' and 'lock-in' in the BOT cases.

Finally, few of the previous studies implied a theoretical framework to support their analysis and discussions, leading to some common and transferable lessons of the BOT model not been drawn and ready to being learnt from.

9.6 Recommended topics for future research

This study explores the problem surrounding the implementation of China's BOTs in the motorway and water sector. Based upon the lessons-learned from the implementation of the PFI programme in the UK, this thesis offered the following recommendations to improve BOT policy in the future. However, due to the nature of this doctoral research work, the study only covered limited areas (6 provinces) for the China's BOT, due to constraints of time and finance. Meanwhile, the majority of interviewees and data were collected from 6 provinces and 10 cities in certain regions of China, where BOTs have been widely implemented. Therefore, this study covered small sample sizes, in terms of the number of interviewees and the number of projects in the 6 provinces selected. The geographical and social-economic contextual differences between China's provinces needed to be considered also. However, all 6 provinces covered by this study were the most active and top players of motorway and water BOTs in China. Most of their experience and lessons on implementing BOTs were highly representative, valuable and transferable.

Based upon the contributions and limitations of this study, it suggests that future useful research should continually focus on the operational performance of China's BOT projects in the motorway and water sectors, since more projects have been commenced since 2009. In addition, the feasibility and potential difficulty of implementing a BOT in China's healthcare, housing, education, railway and defence sectors could be studied, since these areas were newly opened to private contractors in 2010. These proposed studies may also draw and learn lessons from the PFIs in the UK which is the country has with longest history and richest lessons of using a long-term contracting approach in all these fields over the last few decades. Finally, future studies could address the relevance of other countries or regions' experiences when implementing PFI or BOT models in China's infrastructure projects, e.g. countries as Japan, Hong Kong, Taiwan and Australia. As lessons-learning theory (Rose, 2005) suggests, the policy-import countries may look at, compare and analysis the experiences and lessons from different sources, locations and countries, to enable them to gain relevant and reliable findings will be gained.

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Appendices

Appendix 1: The China's Fiscal and Taxation Reforms in 1994 Introduced New Taxes in China in 1994

The most important of the new taxes was the VAT levied on most manufactured goods at the uniform rate of 17%. In addition, a 33% profit tax was introduced, with uniform rates for state, collective, and private enterprises. The system of personal income taxes was unified and made slightly more rigorous. A 'consumption tax' (actually a luxury or excise tax) was introduced for cigarettes, alcohol, and a few other luxuries. A number of minor local taxes were introduced (or more accurately, regularized). In return, the previous system of industrial and commercial taxes was abolished, and the SOE profit contract system was also eliminated.

Tax revenues allocations between the centre and local governments in China

These new taxes were assigned to various levels of government. The central government had complete claim on the consumption tax, customs duties, and most direct and indirect taxes on central-government-controlled sectors (e.g., railroads, financial institutions, and some large centrally controlled Enterprises). Provincial governments had direct control over direct taxes on local enterprises, as well as a number of relatively modest taxes, including real estate taxes, and pollution and resource fees. The key provision was the designation of most VAT revenues as 'shared income', with 75% going to the central government and 25% to the local government.

New institute on managing taxes collection

In order to collect these taxes throughout the country, a new central government taxation authority was created in 1994. Under the previous system, most tax revenues had been collected by local government tax bureaus, and localities had then transferred funds to the central government. Under the new system, the central government first collected the bulk of revenues—including all VAT revenues—and then shared them with the provinces. To manage such a system, a central government tax agency was created and given substantial authority

(Naughton, 2007: 433)

Appendix 2 China's Key facts and indicators in 2009

1. **Total Area of Territory:** 9,600,000 square kilometers

2. **Administrative Divisions (Five Levels):**

Central Government of China

The state council, including 27 ministries, commissions, departments, The People's Bank of China (the Central Bank) and the National Audit Office (China)

Provincial Governments

Four municipalities directly under central administration: Beijing, Tianjin, Shanghai and Chongqing

Twenty two provinces: Hebei, Shanxi, Liaoning, Jilin, Heilongjiang, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Shandong, Henan, Hubei, Hunan, Guangdong, Hainan, Sichuan, Guizhou, Yunnan, Shaanxi, Gansu and Qinghai

Five autonomous regions: Inner Mongolia, Guangxi, Tibet, Ningxia and Xinjiang

One special administrative region: Hong Kong

City Governments: 333

3. **Population:**

Total population: 1,328,020,000

Sex composition: male 683,570,000 (51.47%); female 644,450,000 (48.53%)

Rural–urban division: urban population 606,670,000 (45.68%), rural population 721,350,000 (54.32%)

Birth rate: 12.14 per thousand

Death rate: 7.06 per thousand

Natural growth rate: 5.08 per thousand

4. **Economy:**

Gross National Product (GNP): 30,285,340million yuan

Gross Domestic Product (GDP): 30,067,000million yuan

GDP composition: primary industry 11.3%, secondary industry 48.6%,
Tertiary industry 40.1%
Total volume of exports: 10,039,490 million yuan
Total volume of imports: 7,952,650 million yuan
Trade balance: 2,086,840 million yuan

5. **People's Livelihood:**

Per capita annual net income of rural household: 4,760.6 yuan
Per capita annual disposable income of urban household: 15,780.8 yuan
Annual average wages of staff and workers: 11,298.96 yuan
Annual per capita consumption: 11,242.85yuan
Balance of savings deposit of rural and urban residents: 21,788.54 billion
yuan (16,407 yuan per capita)

6. **Labour:**

Number of people employed: 774.80 million people
Employment composition: primary industry 39.56%, secondary industry
27.24% and tertiary industry 33.19%; urban 302.10 million (39.0%), rural
472.70 million (61.00%)
Number of urban registered unemployed: 8.86 million
Unemployment rate: 4.2%

7. **Education:**

Number of schools: 2,263 regular institutions of higher education, 90,121
secondary schools, 349,126 primary schools
Number of students enrolled: institutions of higher education 6,076,612,
secondary schools 35,087,120, primary schools 16,957,150
Number of full-time teachers: institutions of higher education 1,237,451,
secondary schools 5,855,440, primary schools 5,668,674
Students per teacher: institutions of higher education 4.9, secondary
schools 6.0, primary schools 3.0

8. **Health:**

Number of health institutions: 278,337 (19,712 hospitals)

Number of beds: 4,038,700 (2,882,900 hospital beds)

Number of hospital beds per 1000 population: 3.05

10. **Housing:**

Per capita floor space of residential buildings: rural areas 32.4 square meters, urban areas 27.1 (2006) square meters

11. **Currency:**

1 yuan_0.143986 US dollar

1 yuan_0.097821 EURO

Source: State Statistical Bureau (2010) *China Statistical Yearbook 2010*, Beijing: China Statistical Publishing House.

Appendix3 China's 'Open Door' Policy and Special Economic Zones (SEZs)

In 1979, The People's Republic of China developed its 'open door policy' to help increase trade relations with the global community and also to reinvigorate an economy left stagnant by the Cultural Revolution. The private investors, many of whom were overseas Chinese from places like Hong Kong and Taiwan Initially, the PRC decided to set aside four Special Economic Zones (SEZ's) in southern china and focus their efforts to draw foreign manufacturing there. These four SEZ's were chosen for the following reasons:1) Shenzhen: proximity to Hong Kong 2) Zhuhai: proximity to Macau 3)Xiamen: proximity to Taiwan 4)Shantou: Vast overseas connections with Chaozhou origin Chinese in Thailand and Hong Kong (BBC, 2010).

In a Chinese Special Economic Zone, there were special tax incentives for foreign investments and greater independence on international trade activities. Economic characteristics are represented as '4 principles': Construction primarily relies on attracting and utilizing foreign capital; Primary economic forms are Sino-foreign joint ventures and partnerships as well as wholly foreign-owned enterprises; Products are primarily export-oriented Economic activities are primarily driven by market forces. In addition, the administrative power of SEZ is as same as provincial capital cities in China (Yeung et. al., 2009).

Appendix 4 The reviews on value-for-money and performance of the PFI in the UK

<i>Study</i>	<i>Date</i>	<i>Sample and Cases</i>	<i>Type of study</i>	<i>Better vfm</i>	<i>Comments and conclusion</i>
Arthur Andersen & LSE Enterprise	2000	29 business cases	Initial evaluation	Yes	17% cost savings estimated against the PSC, risk transfer accounted for 61% of forecast savings
National Audit Office	2000	7 business cases from	Business cases	Yes	10–20% cost savings estimated
DoT	2002	250 London Underground projects (1997–2000)		Unknown	Cost over-runs averaging 20% were found
Mott Macdonald	2002	39 traditional projects and 11 PFI projects selected	United Kingdom Multiple cases reviewed	Yes	Traditional ‘public’ infrastructure provision arrangements were on-time and on-budget 30% and 27% of the time, but PFI-type partnerships were on-time and on-budget 76% and 78% of the time, respectively
Pollock et al.	2002	3 NHS hospitals and 8 trusts	Review and re-analysis	No	The PFI justification is a ‘sleight of hand’
Pollitt	2002	10 major PFI cases United Kingdom	Review of National Audit Office cases	Yes	• the best deal was probably obtained in every case, and good value for money was probably achieved in 8 of the 10 cases
Audit	2003	10 traditional	Scotland Audit	No	‘We found no evidence that

Commission		and 8 PFI schools were compared	report		PFI projects delivered schools more quickly than projects funded in more conventional ways' • 'The public sector comparator has lost the confidence of many people . . .'
Edwards et al.	2004	8 cases from roads and 13 hospital case studies	United Kingdom Case reviews and interviews	No	• Contracts reviewed 3 years in • 'PFI is an expensive way of financing and delivering public services . . .'
Ghobadian et al.	2004		General observations United Kingdom Literature review	–	• 'we have no firm evidence that the current PFIs would deliver on their long-term objectives . . .'
Pollitt	2005	General observations of UK cases plus 5 cases	United Kingdom Literature review	Yes	'it seems difficult to avoid a positive overall assessment'
Shaoul	2005	General observations of UK cases	United Kingdom Literature review	No	PFI has turned out to be very expensive with a lack of accountability • Suspects that PFI policies 'enrich the few at the expense of the majority and for which no democratic mandate can be secured'
•Pollock	2007	Re-analysis of	Academic paper	No	'there is no evidence to

et al.		Mott Macdonald and other reports			support the Treasury cost and time overrun claims of improved efficiency in PFI' . . . [estimates being quoted are] 'not evidence based but biased to favor PFI . . .' • only one study compares PFI procurement performance, and 'all claims based on [this] are misleading'
NAO	2009 A	72 NAO reports Over 100 of 641 projects	Literature review and summarize the past cases of the PFIs/PPPs from the NAO	In some cases, But, a fifth of the projects were clearly not achieve vfm	Private finance can deliver benefits but is not suitable at any price nor in every circumstance; Evaluation of the use of private finance is not well developed
NAO	2009 b	114 PFI projects and 50 non- PPP projects across the sectors	Surveys and interviews	-	The report noted that 69 % of PFI projects had delivered on time and 65 % on price. This compares with 63 % of non-PFI projects delivering on time and 54 % delivering on price

Appendix 5 Information sheet and Introduction for this study (Translated from Chinese)

Working Title: The Relevance of the development of PFI's in the UK and their implementation in Build-Operate-Transfer (BOT) in Chinese Road and Water Sectors

Name of researcher: Mr. Jingchi Huang

The topic, areas and researcher involved: An Introduction

Since there are only a few pieces of literature addressing the implementation of BOT models in Chinese motorway and water projects, this study is going to investigate and learn how BOTs are operating in the context of the Chinese motorway and water sectors (the results, problems and obstacles of these applications). It will identify what lessons from the implementation of UK PFIs are relevant to China, in order to improve the BOTs in the motorway and water sectors after considering the potential contexts and conditions in China. It will also make recommendations for China's utilisation of the BOT model within China's socio-economic contexts. The study (interview or focus group or observation) will be carried out by Jingchi Huang, a research student for the Leicester Business School, De Montfort University, Leicester, UK. This study is voluntary, and you are free to withdraw from this research without giving any reasons at any stage.

The procedures of the research

If you decide to participate in the research, the researcher will contact you to make an arrangement to visit and speak to you. The research may take 60-120 minutes of your time to talk about your experiences on implementing (motorway and/or water) BOTs in China.

The data and results collected from you

All information collected from you will be confidential, and will be used for academic purposes. All data collected from you will be kept in a safe place and will be destroyed at

the end of this study.

Finally, if you are interested in the results of this research, a copy of the summary will be sent to you.

Contact for further information

If you would like any further information about the study or need to ask any questions, please contact Jingchi Huang on 0044-(0)7738978055, or E-mail: jingchihuang@gmail.com.

Thanks for your time.

Regards,

Jingchi Huang

Appendix 6 Interview Consent Form (Translation from Chinese)

Title of Study: The Relevance of the development of PFI's in the UK and their implementation in Build-Operate-Transfer (BOT) in Chinese Road and Water Sectors

Name of Researcher(s):

Mr. Jingchi Huang

(De Montfort University, Leicester, UK)

1. I agree to participate in Jingchi Huang's study mentioned above;

Yes/No

2. I agree that I would not receive any payments or gifts from the participations in the Jingchi Huang's research. My participation is voluntary and I reserve the right to withdraw from his study at any stage and at any time, without sending any notice or giving reasons.

Yes/No

3. I agree/do not agree to Mr. Jingchi Huang using an audio-taping device in the interview process or focus group. Mr. Jingchi Huang will keep all of my information private. I also clearly understand that all data and audio-tape will be deleted by Mr. Jingchi Huang when his study is completed.

Yes/No

Name of interviewee _____ Date _____ Signature _____

Witness to consent _____ Date _____ Signature _____

Appendix 7 Pilot Interviews schedule showing key themes and topics

Questions	Guidance/Schedule
Background of Interviewees/organisations	<p>Could you introduce yourself and your duties in your department?</p> <p>And how is it related to BOTs?</p>
Experiences and Contexts BOT	<p>In your opinion, what are BOTs?</p> <p>What policies have been issued by your departments or central government to promote the BOT's implementation in the last ten years, in what contexts?</p> <p>Why does your department want to use the BOT model to develop local infrastructure projects, in what circumstances?</p> <p>What BOTs models have been implemented in what kinds of projects by your company? Why?</p>
<i>Mechanism, Programmes and Implementation of BOT</i>	<p>What are the standard procedures of the implementation of a BOT project?</p> <p>Who will be involved in this process, in what roles?</p>
Outcomes/performance of BOT	<p>Is about the overall performances/outcomes of the BOT projects</p> <p>What factors/drivers/barriers do you think will have effects on the implementation of BOT projects?</p>
<i>Ending Question</i>	<p>What do you think are the benefits and</p>

	<p>drawbacks of BOT?</p> <p>Do you think BOT is a better way to develop local infrastructure projects (than conventional projects)?</p> <p>Why?</p> <p>What are your suggests (extra points) on the implementations of BOTs?</p> <p>Feedbacks on the research questions</p>
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Appendix 8 Interviews schedule and Guidance
(For the Interviewees from the governments, the public agencies and the government-owned companies)

Questions	Guidance/Schedule
Background of Interviewees/organisations	<p>Could you introduce yourself and your duties in your department?</p> <p>And how is it related to BOTs?</p> <p>How many BOT projects have been developed by your department/company?</p> <p>How many projects have you participated and when, where?</p> <p>What is your roles/position/contributions to the projects?</p>
Experiences and Contexts BOT	<p>In your opinion, what are BOTs?</p> <p>What BOTs models have been developed or implemented in what kinds of projects by your department/company?</p> <p>What is the portion/scales of BOTs in total public infrastructure in your province/city/department/company?</p> <p>Why do your department want to use BOT</p>

	<p>model to develop local infrastructure projects, in what circumstances?</p> <p>Which reason/driver/factor do you think it is the most important to make decisions (BOT if should be adopted)?</p> <p>Why?</p>
<p><i>Mechanism, Programmes and Implementation of BOT</i></p>	<p>what are the administrative and approval procedures when local government is going to build a project by using BOTs?</p> <p>What policies are related to the adoption of BOTs?</p> <p>What departments of the government involved in?</p> <p>What preparation work has to been done by your department/organisations, by whom?</p> <p>How does government arrange a BOT procurement and bidding?</p> <p>(How do you make sure it is fair and open? What are the procedures and what standard will be used to evaluate potential bidders? How long will it be at what costs?)</p>

	<p>What about the BOTs contracts? Who did design it? Who are responsible for the negotiations details?</p> <p>If any external advisors have been introduced</p> <p>And how does your department/ organisation/ government ensure the BOTs projects were built and operate in accordance with the contract requirements, such quality, time etc.?</p>
<p>Outcomes/performance of BOT</p>	<p>Have your BOT projects finished constructions, on time and without cost-overrun?</p> <p>How many BOT contracts were terminated?</p> <p>Why?</p> <p>What factors/drivers/barriers do you think will have effects on the implementation of BOT projects?</p> <p>Which one(s) are crucial in your opinion?</p> <p>What do you think the benefits and drawbacks of BOT?</p> <p>How do you think the cooperation between you and the local governments?</p>
<p><i>Ending Question</i></p>	<p>Do you think BOT is a better way to develop local infrastructure projects (than conventional projects)?</p> <p>Why?</p>

	What are your suggests (extra points) on the implementations of BOTs
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**Appendix 9 Interviews schedule and Guidance
(for the BOT contractors)**

Questions	Guidance/Schedule
Background of Interviewees/organisations	<p>Could you introduce yourself and your duties in your department?</p> <p>And how is it related to BOTs?</p> <p>How many BOT projects have been developed by your department/company? How many projects have you participated and when, where?</p> <p>What is your roles/position/contributions to the projects?</p>
Experiences and Contexts BOT	<p>In your opinion, what are BOTs?</p> <p>Why do your company want to undertake BOT projects, in what circumstances?</p> <p>Which reason/driver/factor do you think it is the most important to make decisions? Why?</p>
<i>Mechanism, Programmes and Implementation of BOT</i>	<p>Where and how did you get the relevant information about the BOT bidding?</p>

	<p>What preparation work has to be done by your company, by whom? (What documents do you need to provide when your company is going to bid a project?)</p> <p>Did you experience any difficulties and problems in the bidding process (What assistance do you receive from the procuring bodies)?</p> <p>How did your company win the project (s)? What are the key success factors to win a BOT project, in your opinion?</p> <p>What about the BOTs contracts? Who did design it? Who are responsible for the negotiations details?</p>
Outcomes/performance of BOT	<p>How is about the overall performances/outcomes of the BOT projects (Finished on-time and in Budget?)</p> <p>What standards or criteria have been used to evaluate your performance by your public clients? (Any Bonus or Penalties?)</p> <p>What factors/drivers/barriers do you think will have effects on the implementation of BOT projects?</p>

	<p>Which one(s) are crucial in your opinion?</p> <p>How do you think the cooperation between you and your private contractor partners(s)? (any arguments? And how did you sort it?)</p>
<i>Ending Question</i>	<p>(Optional Question: are you satisfied with your profitability of the BOT contracts? Why?)</p> <p>What are your suggests (extra points) on the implementations of BOTs in the future</p>

Appendix 10 Research Ethical Approval



3

FACULTY OF BUSINESS AND LAW - BUSINESS SCHOOL

ADVANCE APPROVAL OF RESEARCH ACTIVITY INVOLVING HUMAN RESEARCH
ETHICS - BUSINESS SCHOOL

Staff/Student Name

Programme/Diet (if relevant)

JINGCHI HUANG

Title of Research Project

The Relevance of UK PPP/PFI Experience to Chinese Urban
Transport Projects

I agree that in conducting the above research project I will comply with the Market Research Society Code of Conduct as published in their revised July 1999 statement. The rights of respondents are recognised in sections B3 through B8 of the code as per attached to this form. In cases where it is not appropriate to provide written statements, respondents will always receive a verbal statement that their co-operation is voluntary, that anonymity will be preserved, and the purpose for which information is being collected.

I further agree that I will always carry with me and show to respondents my staff/student identification card.

Signature of Researcher/Student *Jingchi Huang* Date: 18/9/06

Signature of Director of Studies/Supervisor *Am Patel* Date: 18/9/06

Signature confirming approval by Designated Officer *RPA Harris* Date: 20/9/06

Supplement Paper on the Application of the Ethical Approval

Research Project Title: The Relevance of UK PPP/PFIs Experience to Chinese Urban Public Transport Industry

The Researcher (The Student) Name: Jingchi Huang

Student ID: P03213661

This research hopes to explore how the British PPP/PFIs can help in such initiatives that are implemented in the Chinese urban public transport projects.

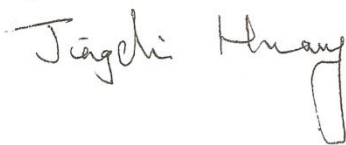
According to the research questions of this study, an interpretive paradigm will be adopted to explore the question of how Chinese PPPs/PFIs have been developed up to the current situation. There will be an analysis of these developments compared to the UK developments of PPPs to identify lessons to be learned. Therefore, a qualitative method is the most appropriate. An qualitative analysis of the socio-economic influences on public transport infrastructure will be used to develop and give recommendations on policy development for Chinese PPPs.

The main data collecting methods used in this study will involve the a series of open and semi-structured interviews, and discussions with different focus groups. The main sources of primary research will be a range of groups including the policy makers in China, Chinese academics, practioners and the UK academics. There will be interviews with Chinese policy staff and discussions with different focus groups in China during each year of the study. The interview access has already been agreed with the officers in charge of PPP in He'nan Province, China.

The secondary data will be directly gathered from the different public sources in the UK and China.

As required by the De Montfort University ethical regulations, the researcher has carefully reviewed the proposed research plan and considered the possible ethical problems that could arise in carrying out the research. The scope for ethical issues is limited due to the focus on public financial management and public policy. However, the issue of gathering information about human beings and organisations remains and will be dealt with by clear identification of information that is considered confidential by interviewees/participants and by protecting personal and organisational (commercial institutions) privacy and keeping safe and secure records of any such information.

Signature:

A handwritten signature in black ink, appearing to read 'Jingchi Huang', with a stylized vertical line extending from the bottom of the name.